AMERICAN
DYESTUFF REPORTER

VOLUME XXII JANUARY 16, 1933 NUMBER 2

Washington News Letter

(Special Correspondence from the Capital)

By **WALDON FAWCETT**

SHORT session though it be, with all the obstacles to legislation which tradition imputes to the final sitting of a so-called "lame duck" Congress, there are extensive possibilities for contacts with the dyestuffs industry in the 1932-33 program of the 72nd Congress, even in the routine annual Appropriation Bills which are the first responsibility of the legislative body. For, upon the Budget policy revealed in these "supply bills," will depend the pursuit, in the fiscal year beginning July 1, 1933, of the chemical research by Federal agencies that in their independent and cooperative investigational work have become a factor in the progress of the color industries.

In considering the future of national legislation, directly or indirectly affecting the status of science and industry, it is desirable to make allowance for certain exceptional influences which are at work. On the one hand, there is the desire of an element in the present Congress to, this winter, clear the desk of all pressing issues, difficult as that may be in a working period of twelve weeks, so that there may not be need for a special session of the new, or 73rd Congress, immediately after March 4. On the other hand, there is the contingency that, if a sufficient proportion of the remaining States ratify the pending Constitutional Amendment to change the date for the annual assemblage of Congress, the 73rd Congress would not be due, in regular session, until January, 1934.

Legislative Potentialities of 1932-33

For the textile chemistry group and associated interests, there are diverse possibilities of reaction from both the general and the special legislative proposals now pending or in immediate prospect in Congress. Of the major issues, the waiting questions of policy which obviously contact the group, are, respectively, Taxation, the Tariff, Unemployment Relief, and Prohibition. The Tariff problem, controversial ever, is complicated for the moment by relationship to the acute issue of international debts. The Revenue worry and the agitation for Budget balancing is pregnant with a resurrection of the project for a Manufacturers' Sales Tax.

Special legislative candidates, no less numerously than the general issues, have connections within the chemical-textile field. Hardy perennials such as the Scientific Calendar and the proposed substitution of the Metric System have poor promise of attention in a crowded session. The energetic campaign for revision of the Bankruptcy laws allows that project a fighting chance, and the same might be said of the Capper-Kelly Bill for Resale Price Fixing. The hope that springs from lack of serious opposition is enlisted for Trade Mark Revision and Consolidation of Label Copyright. Compulsion for "Truth-in-Fabrics" Labeling, being a controversial question, is likely to be shunned and the same handicap obscures the outlook for the attempted modification of the Anti-Trust Laws to permit reasonable cooperation and regulation of output in industry.

The Textile Design Bill

What chance has the bill to establish the institution of Textile Design Copyright? This question is a leading one in the light of the coalition drive under the leadership of Messrs. Moss, Cheney and Gotshal. The immediate future of the Textile Design Bill is difficult of conjecture because of the balance of assets and liabilities. Manifestly it is of advantage that, since public hearings on the bill were conducted so recently as last spring, no further forums should be necessary to enlighten Congress in respect to trade sentiment. Similarly, the legislative path is smoothed if the concessions in the applicability of the measure to distributors have served to remove the last vestiges of opposition by organized retailers.

Running against the forces of conciliation and unified effort within the textile ranks is the tradition of the disinclination of any expiring Congress to enter upon consideration of a new project in special legislation. There is, indeed, some warrant for this reluctance in the record of experience which has shown that, even though, by good luck or good management a special bill passes one house of Congress in a short session, the chances of concurrence in the other house are poor. At that under normal circumstances, there would be, for the long pull, a sentimental advantage in the acceptance of the Textile

Design Bill by even one house at the session. But the 73rd Congress will bring so drastic a shake-up in personnel that it is a question whether any carry-over of prestige will avail.

Increase in Chemical Service

A steady increase, over a period of six years, in the commercial services rendered in the field of chemicals is shown by a tabulation just completed by the U. S. Bureau of Foreign and Domestic Commerce covering the interval from 1927 to 1932—coverage being by fiscal years ending June 30. The services rendered by the Bureau and its thirty-four district offices, as listed, consist, in each instance of a personal contact by visit, telephone or telegraph or letter with an American business firm or individual. The annual totals as computed are: year 1927, 122,300; 1928, 126,007; 1929, 146,122; 1930, 170,581; 1931, 193,827; and 1932, 203,662. As a result of the first aid rendered by the Commerce Bureau at Washington one of the large cotton piece and thread mills in Georgia this past year reported an increase in foreign business amounting to $187,453. A textile mill in Alabama, specializing in denims, yarns and twills, gave the Government Bureau credit for $487,000 of its export business in the twelve months ending July 1, last.

Current Certification of Food Colors

Statistics just compiled show that the production of certified food colors for the fiscal year 1932 was lower than that for 1931, and is actually the lowest during the last five years. In view of the general situation, however, Mr. H. T. Herrick, Principal Chemist in Charge of the U. S. Certification Laboratory, feels that the recorded decrease is not at all surprising. Indeed, his deduction is that the fact that the total output of food colors has held up as well as it has during the past year is striking testimony to the need that is felt for reliable sources of harmless food colors.

Fifty-two firms (one of which was a new certifier) certified colors during the past year. The aggregates of commercial food colors examined show a total of 275,420.00 pounds of straight dye certified under foundation certificates. The repacked straight dyes amounted, in the twelve months, to 21,005.00 pounds. And the mixtures totaled 293,002.07 pounds. Only four batches of straight dye and eight batches of mixtures were rejected during the year.

The relative quantities of each of the straight dyes certified (not including repacked colors) are as follows: Orange I, 33.280; Tartrazine, 24.450; Amaranth, 21.990; Ponceau 3R, 7.410; Yellow OB, 3.390; Yellow AB. 3.225; Sunset Yellow FCF, 3.220; Erythrosine, 1.690; Brilliant Blue FCF, .840; Indigotine, .500; Naphthol Yellow S, .002; Fast Green FCF, .001; Guinea Green B, .001; Light Green SF Yellowish, .001.

To enable comparison of the turnover of the past year it may be recounted that the quantity of straight dyes certified in 1929 aggregated 337,802.50 pounds; in 1930, 318,849.50 pounds; and in 1931, 290,715.00 pounds. As compared with 275,420.00 pounds in the 1932 interim. The repacks of 21,005.00 in 1932 are to be set over against 28,589.25 in 1929; 36,646.00 in 1930 and 25,329.00 in 1931. The sum-up of 293,002.07 pounds of mixtures in the year 1932 is a descent from 333,906.57 pounds in 1929; 331,023.46 pounds in 1930; and 337,813.96 pounds in 1931.

From the high mark of 62 in 1929 the total number of producers submitting colors for certification dropped in 1930 to 55. There was a further reduction to 52 firms in 1931 and this figure held through the past year. As against ten new firms appearing in this branch of the color industry in 1929 there was but a single recruit in 1930, three accessions in 1931, and one addition in the twelve months last elapsed. No additions to the standing list of colors have been announced in 1932. So far as may be foreseen at this time there is no prospect that 1933 will see any increase in the roster of approved colors. On the other hand, there is no recurrence of the suggestion of several years ago that certain colors might be dropped. There is, at the present time, some agitation for the admission to the list of an Oil Red but this proposal is, as yet, at the stage of discussion. There is no occasion to apprehend that the curtailment of Departmental appropriations, in the effort to balance the Federal Budget, will interfere with the routine examination of food colors. During 1932, a total of 1,137 batches were examined. This compares with 1,206 batches in 1929; 1,274 batches in 1930 and 1,341 batches in 1931.

Bureau of Economics Extends Textile Studies

In an effort to meet, on behalf of householders, some of the problems of the present emergency, the U. S. Bureau of Home Economics has broadened the scope of its textile investigations. Especially in so far as these deal with more effective and more extended uses of American-grown cotton and wool. The intent is to find basis for recommendations for improvements in quality and changes in production programs, supposedly beneficial to consumers. Also, the attention of manufacturers is to be directed to new types of fabrics which will meet specific needs of consumers.

Virtually completed, as a part of this program, is a study of three different grades of American upland cotton sheeting. Changes in the physical properties of the fabrics during wear have been followed by means of laboratory tests on breaking strength, bursting strength, and weight. The chemical changes were studied by viscosity determinations, methylene-blue absorption measurements, and copper number tests made at intervals during the life of the sheets. The results of the chemical tests, the physical tests, and the tests of actual wear show exact correlation for each grade of fiber. Since, however, this is the first experiment of its kind on the relation of fiber grade to wearing quality of the finished fabric, further study will be needed to show whether the results already

(Continued on Page 68)

PROCEEDINGS OF THE
American Association of Textile Chemists and Colorists

Officers of National Association

President

ROBERT E. ROSE
E. I. Du Pont de Nemours & Co., Wilmington, Del.

Vice-Presidents

WILLIAM H. CADY—ALEX. MORRISON

Treasurer

WILLIAM R. MOORHOUSE
National Aniline & Chemical Co., Boston, Mass.

Secretary

A. NEWTON GRAVES
Franklin Process Co., Providence, R. I.

Councillors

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H. M. CHASE **HUGH CHRISTISON**
CARL Z. DRAVES **WALTER M. SCOTT**

President Emeritus and Chairman of the Research Committee

LOUIS A. OLNEY
Lowell Textile Institute, Lowell, Mass.

Local Sections and Their Officers

Northern New England Section
Leverett N. Putnam, Chairman, Worsted Division, Pacific Mills, Lawrence, Mass.
Clarence L. Nutting, Secretary, Arlington Mills, Lawrence, Mass.

Rhode Island Section
Heyward F. Lawton, Chairman, Borden & Remington Co., Providence, R. I.
C. Brian Wainwright, Secretary, Apponaug Co., Apponaug, R. I.

New York Section
Henry F. Herrmann, Chairman, General Dyestuff Corp., 230 Fifth Ave., New York City.
Thomas R. Harris, Secretary, Herrick & Voigt, 220 E. 42nd St., New York City.

Philadelphia Section
William A. Stringfellow, Chairman, Ankokas Mills, Mount Holly, N. J.
Charles A. Seibert, Secretary, 311 South Riverside Walk, Penn's Grove, N. J.

Piedmont Section
A. R. Thompson, Jr., Chairman, North Carolina Finishing Co., Salisbury, N. C.
Hugh Puckett, Secretary, Chas. H. Stone, Charlotte, N. C.

South Central Section
Noel D. White, Chairman, Davenport Hosiery Mills, Chattanooga, Tenn.
Andrew Kelly, Secretary, Burkart-Schier Chemical Co., Chattanooga, Tenn.

Midwest Section
Carl E. Bick, Chairman, Real Silk Hosiery Mills, Indianapolis, Ind.
Frank J. Acker, Secretary, National Aniline & Chemical Co., Chicago, Ill.

South-Eastern Section
E. A. Feimster, Chairman, Eagle and Phoenix Mills, Columbus, Ga.
Charles Ordway, Secretary, Alabama Polytechnic Institute, Auburn, Ala.

Lowell Textile Junior Section
Joseph Pizzuto, Chairman; Raymond Matthews, Secretary.

North Carolina State College Junior Section
R. A. Gilliam, Chairman; D. B. Hardin, Secretary.

BUSINESS MEETING
Annual Meeting, Saturday Morning, December 3, 1932

The meeting convened following the scientific program, P. J. Wood, President, presiding.

President Wood: Gentlemen, this is the Twelfth Annual Meeting of the Association.

We will first have the Secretary's Report.

. . . Secretary Graves presented his prepared report . . .

Secretary's Report
December 5, 1931 to November 1, 1932

Since the Annual Meeting in Boston, Mass., December 4th and 5th, 1931, the Council and Research Committee have each had six meetings as follows:

Jan. 22, 1932, at Chemist's Club, New York.

Mar. 11, 1932, at Providence Biltmore Hotel, Providence.

Apr. 1, 1932, at Bureau of Standards, Washington.

Apr. 29, 1932, at Chemist's Club, New York.

June 3, 1932, at Engineer's Club, Boston.

Sept. 16, 1932, at Engineer's Club, Boston.

The following numbers have been elected to the different classes of membership:

Active	57
Junior	17
Student	34
Associate	21
	129

19 less than last year.

There have been the following suspensions because of non-payment of dues:

Active	109
Junior	41
Associate	7
	157

54 more than last year.

Resignations to date are as follows:

Active	11

18 less than last year.

There have been brought to our attention deaths as follows:

Active	2

11 less than last year.

The membership at present is made up as follows:

Active	1032
Junior	115
Student	34
Associate	64
Corporate	29
	1274

The Student membership, organized this year, has added thirty-five members to the Association.

During the year the Council saw fit to change the boundaries of the various local Sections for convenience of members in attending meetings.

The Research Program, with the aid of a grant from the Textile Foundation, was continued by our three Research Associates.

The Council has seen fit to cause to be made certain changes and amendments to the Constitution on which the membership will be asked to vote at this meeting. These amendments are in detail on the back of the program.

The Secretary wishes to express his thanks for the cordial cooperation he has received from so many members in the performance of his duties.

Respectfully submitted.

A. NEWTON GRAVES, *Secretary.*

President Wood: You have heard the report of the Secretary. What is your pleasure?

Mr. Arthur Thompson: I move it be accepted.

. . . The motion was duly seconded and carried . . .

President Wood: The economic condition during the last year has, of course, affected our Association but probably not as much as we might have expected. The difficulty of collecting dues has been more apparent, of course, than in former years but in spite of that I think the Association has made a splendid showing.

As the Secretary pointed out in his report, the student class has yielded a small increase in membership which I think with a little attention on the part of the senior sections where these students are available for membership can be greatly increased during the coming year, and I hope attention will be paid to that phase of the work by the various sections involved.

During the year the Association suffered a serious loss in the death of Harry Davies. Harry Davies was not only a splendid member of the Society and a good Treasurer but he was a very good personal friend to many of us and a very able and well-informed textile chemist and a credit to the organization.

As a tribute to Harry Davies, I would ask you to rise and stand in silence one minute. (The members arose and stood in silent tribute to the memory of Harry Davies.)

It became necessary, of course, owing to the passing away of Mr. Davies to appoint a treasurer and Mr. Moorhouse was appointed by your President—an absolutely unauthorized procedure I am well aware, but a special meeting was called at the Providence Biltmore—I forget the date, but it was shortly after Mr. Davies' death—at which this action was ratified.

This drew attention to the fact that we had no means of replacing officers taken away by death or resignation. We had made no provision for such events in our Constitution, but I think that matter will be rectified.

There isn't very much more to say except that the work of the Association has been carried out by the Council in its usual efficient manner. The meetings have been very well attended. The records have been excellently kept and if there have been any failings and shortcomings we have been reminded of them by the membership and those matters have been promptly attended to.

I should like to thank all the members of the Council for their cooperation with me as President during my two terms, and the Secretary for his very efficient work, and also the members of the different sections where we have held our conventions during the last two years for their painstaking efforts to entertain us in a right royal way, also the Program Committees who have acted very efficiently in providing us with good material for very fine programs.

In retiring from this position I can only look back on the last two years with a great deal of pleasure, not only for the scientific and technical help that I have received personally by being a member of the Association, but also from the very friendly attitude of all with whom I have been associated in this work, and I wish the Association godspeed under the guidance of its new officers in the coming year.

Thank you. (Applause.)

We will now take up the amendments. Mr. Cady will present this matter at this time, after which we shall proceed to the announcement of the election results.

Amendments

Mr. Cady: Gentlemen, we have five amendments to propose as you will see by the fourth page of the program. I shall have to explain them one at a time. Perhaps we had better act on them one at a time also.

The first amendment is for the purpose of increasing the financial resources of the Association; as you will see when the Treasurer's report is read the Association is going behind this year some $1,500. While we have a comfortable surplus at the present time we can't keep on going behind.

There are three alternatives. We can cut down the work of our Research Department, which, of course, is not to be considered for a moment. Second, we can raise the dues. The Council has discussed this idea several times and it is unanimously agreed that if we were to increase the dues at the present time it would result in a net loss because we would lose more members than we would gain by increasing the dues. The only other alternative is to ask for voluntary donations.

In order to make it easy and convenient we propose the following amendment:

"Article VI, Paragraph 3: Any member, Active, Junior

or Associate, who agrees to support the activities of the Association by the payment of at least ten dollars annually, in addition to the regular dues, shall be designated a Sustaining Member."

That means this will have to be done by voluntary action of the members.

President Wood: Do I hear a second to that?

Mr. Cady: I move this amendment be accepted.

. . . The motion was duly seconded . . .

President Wood: Is there any discussion?

. . . There being no discussion the motion was put to a vote and carried . . .

Mr. Cady: The next amendment is for a somewhat similar purpose and reads: "Any member, Active, Junior, or Associate, who shall pay into the treasury of the Association the sum of one hundred dollars shall be designated a Life Member and shall be exempt from any further payment of annual dues."

This will not really result in any additional funds for current uses of the Association because any money received for this purpose would have to be invested. But it seems quite customary for organizations to have this class of membership and the Council considered the matter favorably.

I move that this amendment be accepted.

. . . The motion was duly seconded . . .

President Wood: It is moved and seconded that the amendment to Article VI, Section 4, be adopted. Is there any discussion?

. . . The motion was put to a vote and carried . . .

Mr. Cady: The next amendment, which is the addition of a Paragraph 5 to Article VI, is simply to prevent the possibility of an active member losing the right of voting by virtue of his being transferred to Sustaining or Life Membership. It reads:

"Active members who are thus transferred to Sustaining or Life Membership shall retain all the privileges of Active Membership which they previously enjoyed."

I move that this amendment be accepted.

. . . The motion was duly seconded, put to a vote, and carried . . .

Mr. Cady: The next amendment which is proposed I will read: We propose to strike out of the Constitution in Article VIII, Paragraph 1, the sentence which reads, "A retiring President shall also be a member of the Council for one year after the election of his successor," and substitute the following: "A retiring President shall automatically become a Life Member of the Council."

I don't think that needs discussion. If anybody wants to discuss it, however, we will be glad to hear it.

I move that the amendment be accepted.

. . . The motion was duly seconded, put to a vote, and carried . . .

Mr. Cady: The next amendment which we propose is to take care of the contingency that President Wood mentioned a few minutes ago, and is as follows: Add the following to Article VIII:

"Paragraph 6. The Council shall fill any vacancies which may occur in the list of officers between Annual Meetings."

I move that this amendment be accepted.

. . . The motion was regularly seconded, put to a vote, and carried . . .

Mr. Thompson: You skipped one.

Mr. Cady: I did that purposely, as you will see.

The next amendment which we propose is quite fundamental.

When this organization was started twelve years ago there were no local sections and the membership was concentrated mostly in New England and New York. At that time it was considered necessary to have only a small Council, all of whose members were elected by the general association. But now we have sections in eight different localities covering one-half the territory of the United States and the Council is no longer representative of the entire membership. It seemed desirable to have each section elect at least one of its members a Councilor so that all the sections would be equally represented on the Council and we therefore propose the following amendment, which is mostly a question of changing the wording of certain paragraphs in the Constitution in order to provide for this:

Article VII, Paragraph 1, line 3: Change "Councilors" to "Councilors-at-Large." (That refers to the Councilors who are now elected by the Association as a whole, the six Councilors elected, two each year.) Insert after the words, "All of the foregoing," the words, "together with one Councilor from each local Section, to be elected as provided in Article XV." Omit the words, "and the Chairmen of Local Sections" in the following sentence, and change "members" in the last line to "a member."

Anyone who takes the trouble to read the Constitution will see the reason for these changes.

Paragraph 2, lines 2, 3, 4, 5—substitute for "Councilors" the words "Councilors-at-Large."

And the same applies to Paragraphs 3, 4, and 5.

Article XV, after Paragraph 3, insert new paragraph to read: "Each Local Section shall elect annually one of its Active Members to represent it on the Council of the Association."

Also Article XIV, Paragraph 1—this was overlooked when we first planned these changes but it will be necessary to make the change in order to be strictly correct—under present conditions the chairmen of all the local sections are ex-officio members of the Council; we propose to strike out the sentence in the Constitution which provides for that and which now reads, "The local chairman shall become ex-officio a member of the Council of the

Association and must be an active member." That means that there will still be the same number of Councilors in the future as we have had in the past, only the local sections will elect their councilors as such instead of simply electing a chairman and having him Councilor ex-officio.

Mr. Chairman, I move that that amendment be accepted. . . . the motion was duly seconded . . .

President Wood: Is there any discussion on any of these points?

Of course, I suppose you realize that the object of this last change is to provide for the local sections electing men who are able and willing to make the long trip involved to attend the Council meetings.

Dr. E. H. Killheffer: It may be the chairman or someone else.

President Wood: That does not exclude the chairman but the chairman is no longer ex-officio a member. The office is elective and not automatic.

Is there any further discussion? If not, I will put the motion.

. . . The motion was put to a vote and carried . . .

Mr. Cady: The last amendment is still more fundamental.

There has been criticism expressed that the Councilors are self-perpetuating, that is, that once a man is elected to the Council he remains on it for life, and there is a feeling that there should be more change in the personnel of the Council from time to time. We therefore propose an amendment which will limit the length of time which a man may remain on the Council continuously. The amendment as now written and which you may want to change reads as follows:

Article VIII, Paragraph 3: Omit the words, "and the retiring officers and Councilors shall be eligible for re-election." Add, "Any person who has served for three consecutive years as an elected member of the Council shall be ineligible for re-election as an officer or Councilor for a period of one year. Provided, however, that the offices of Secretary and Treasurer shall not be affected by this rule."

I shall have to explain in the case of this last sentence that in almost all organizations the offices of Secretary and Treasurer are permanent, or should be, as it would be a hardship to have to change those officers every three years.

In so far as the President is concerned there has been a feeling expressed that if a man who was serving his last year—his third year—as a member of the Council were the most eligible candidate for President it would be very unfortunate if he couldn't be promoted to the office of President simply because of this Constitutional restriction and that is why we have exempted the office of President.

I think we ought to have some discussion on that before we vote on it.

President Wood: Is there any discussion on this amendment?

Dr. Powers: Should that include the possibility of a Councilor becoming a Vice-President?

Mr. Cady: My own feeling is that there is no essential difference between a Councilor and a Vice-President, except that the Councilor is elected for three years and the Vice-President for one year. I don't think that you can consider a Vice-President as being a Councilor who has been promoted.

. . . The question was called for . . .

President Wood: Is there any further discussion? Did you put the motion, Mr. Cady?

Mr. Cady: I will put the motion. I move that this amendment be accepted.

. . . The motion was duly seconded . . .

President Wood: It has been moved and seconded that this change be made in this particular article.

. . . The motion was put to a vote and carried . . .

President Wood: As is our custom the action taken here, of course, merely puts the amendment before the entire membership by means of a letter ballot. That ballot will be sent out by the Secretary in due course.

Mr. A. P. Howes: Mr. President, will this amendment making the President a life member of the Council be retroactive, so as to include our Presidents who have already occupied the chair?

President Wood: I should imagine it would.

Mr. Howes: There was nothing said about it but I should think that would be obviously understood.

President Wood: That could be included in the—

Mr. Howes: I should think it would be well to add that.

Mr. Thompson: I move that amendment be made to the original motion.

. . . The motion was seconded by Mr. Vieira . . .

President Wood: Mr. Thompson moves and Mr. Vieira seconds the motion that that amendment be made to the original motion. Is that agreeable to you, Mr. Cady?

Mr. Cady: I didn't hear the wording of it.

President Wood: The wording was that the action be made retroactive, so as to apply to Presidents already retired.

Mr. Cady: I agree with that amendment.

President Wood: I don't see any objection to that. Is there any further discussion?

. . . . The motion was put to a vote and carried . . .

President Wood: Now, gentlemen, will you pay attention to the reading of the report of the tellers?

Secretary Graves: The following votes were cast for President:

Robert E. Rose	310
Arthur Thompson, Jr.	1

Mr. Thompson: I move that be stricken from the record. (Laughter.)

President Wood: I think it is unfortunate we haven't all the membership here so that man who did vote for you could stand up. (Laughter.)

Secretary Graves: For Vice-President:

William H. Cady..... 311
Alex. Morrison 310
A. R. Thompson, Jr..... 1

Mr. Thompson: I again move that be stricken from the record. I insist.

Dr. Killheffer: It seems to be a habit. (Laughter.)

Secretary Graves: For Treasurer:

William R. Moorhouse..... 311

For Secretary:

A. Newton Graves..... 311

Councilors for 3 years:

Wm. D. Appel..... 311
Hugh Christison 310
R. W. Arrington..... 1

Councilors for 2 years:

Carl Z. Draves..... 310
Bob Wheeler 1

President Wood: You have heard the report of the Tellers. I declare the following gentlemen elected for the various offices:

President—Dr. Robert E. Rose.
Vice-President: W. H. Cady, Alex. Morrison.
Treasurer—W. R. Moorhouse.
Secretary—A. Newton Graves.
Councilors: Hugh Christison, Wm. D. Appel, Carl Z. Draves.

That is the report of the Tellers, gentlemen, and these gentlemen are duly elected, and I congratulate them on the splendid running they made. Changes of administration seem to be in the air lately. (Laughter.) We wish them good luck in their efforts in behalf of the Association. (Applause.)

I should like to present the new President. Dr. Rose needs no presentation to this company I am quite sure but I am glad to congratulate him and wish him well as our new President. (Applause.)

President-Elect Rose: I am glad I didn't succeed my predecessor because he occasioned any depression. (Laughter). I am also glad that my term starts in the South on a beautiful day. I wish to thank the membership, those here, and those beyond those here, the other members, even beyond the 311 who have made me President. I wish to assure all the members of the Association that I have no delusions regarding the work that the office implies and the work that is necessary to carry forward the splendid tradition of the office I am taking over, and I pledge myself to do what I can, without making any platform promises. (Laughter and applause.)

We have some reports to listen to; the Treasurer's report is the first one.

Mr. W. R. Moorhouse: The Treasurer's report really shows our cash position as of October 31st. Mr. Cady said we went behind $1,500 this year. Our cash position doesn't show that. That is really due to the fact that during this fiscal year we only made one payment, to the Howes Publishing Company, whereas usually we make two payments. The second payment was made after November 1st.

. . . Mr. Moorhouse presented his report as Treasurer . . .

Treasurer's Report
1932
(Beginning Nov. 19, 1931—Ending Oct. 31, 1932)

GENERAL FUND

Cash on hand—November 19, 1931		$4,223.95
Receipts—November 19, 1931 to October 31, 1932		6,758.99
Interest—Checking Account		21.58
Interest—Savings Account		179.71
		$11,184.23
Expenditures—November 19, 1931 —October 31, 1932	$3,787.03	
Transferred to Research Account	1,000.00	$4,787.03
Balance—as of November 1, 1932		$6,397.20

RESEARCH FUND

Cash on hand—November 19, 1931	$2,858.90
Receipts—November 19, 1931 to October 31, 1932	1,613.25
From Textile Foundation	5,000.00
Transferred from General Fund	1,000.00
	$10,472.15
Expenditures—November 19, 1931 to October 31, 1932	$8,370.33
Balance—as of November 1, 1932	$2,101.82

BANK BALANCE
November 1, 1932

General Fund	$6,397.20
Research Fund	2,101.82
Balance	$8,499.02
First National Bank Checking Account	$2,372.82
First National Bank Savings Account	$6,126.20
Total	$8,499.02

Respectfully submitted,
W. R. MOORHOUSE, *Treasurer.*

President Rose: You have heard the report, gentlemen. What is your pleasure?

Mr. P. J. Wood: I move it be received and filed.

. . . The motion was duly seconded, put to a vote, and carried . . .

President Rose: We have the report of the Research Committee to take up but I think it would be advisable since the hour is growing so very late to postpone that to the very first item after lunch.

Dr. Killheffer: Mr. President, before adjourning I should just like to say a word.

When one of our members accepts the high honor of the office of President of the Association he accepts with that honor quite considerable responsibility and quite a few duties which he performs throughout his term to the best of his ability and with the interests of the Association at heart.

As you will undoubtedly find out there are considerable duties to be performed and there is considerable time to be spent in the interests of the Association.

I think it is only fitting and proper therefore that we express the sentiment of the Association and record in our minutes our feeling of appreciation and thanks to the retiring President, Mr. Wood, for the service that he has rendered in the two terms that he has occupied that office. (Applause.)

President Rose: Let us rise to express our appreciation to Mr. Wood.

. . . The members arose, signifying their appreciation and thanks to Mr. Wood for the manner in which he conducted the office of President during the past two years . . . (Applause)

Mr. Wood: Thank you, gentlemen. I assure you I have had a great deal of pleasure in occupying the office for the last two years. As I said before I should like to thank everybody for everything they have done for me. Everyone has been very nice and I do wish my successor the best of success.

Mr. Schroeder: Sir, a few of our members are unemployed right now and I notice about a hundred of them have been dropped because of non-payment of dues Surely our Association owes its members some help in attempting to find them places I should like to inquire if it is possible to do something about that. I know of two men in particular. Our Association should help to hold up its standard of membership and I should think it might be possible to place something in front of the membership in order to help a situation of this nature.

President Rose: Mr. Schroeder, have you any formal motion that you would like to put before the meeting, or do you simply offer that as a suggestion for the consideration of the Council?

Mr. Schroeder: I think the local councils ought to handle it.

Mr. Howes: Mr. President, we were speaking about that very thing a day or two ago, and we were wondering just how the mechanics of the thing could be worked out. Professor Olney and I particularly thought that the Howes Publishing Company at its office might do all the clerical work involved—we would be perfectly willing to do it—and that the Association might advise its members that any of them who were out of employment and wished positions, or even those who were unhappily employed, could send their names to the Secretary of the Association with a brief list of their qualifications for the type of job they were best fitted for. The Secretary then could forward that information to us and we could keep a card index file, grading those names according to the class of job, that is, chemists, salesmen, or whatever it might be. Then it could be made known generally throughout the trade among employers that we had such a file and when an employer wanted someone to fill a position he could advise the Secretary. The Secretary would in turn send us information as to the character of the vacancy to be filled and we would send to the employer the names and addresses of all the men who were listed with us as being available for that kind of position.

I think that might help a little bit anyway.

President Rose: Was it something of that sort that you had in mind?

Mr. Schroeder: I think that is fine, Dr. Rose.

President Rose: Unquestionably, that is one of the grave problems before the Association and it is something that the Council ought to take under consideration very carefully.

Professor Grimshaw: May I take just a minute to talk on something that I don't want to discuss this afternoon when the guests are present?

I want to speak about the student members. I am just talking about North Carolina State College at the present time. I should like to ask—and this should come through the Council—that three advisers be appointed from possibly the officers of the Piedmont Section to help out with the student section. Up to the present time there hasn't been much interest evidenced by the older members in the student section. One or two men have taken some interest in it. I should like to have them show more interest. Some of the members have come down and have helped considerably by talking to these boys. I get them or try to get them to join, through the DYESTUFF REPORTER and the Year Book.

. . . . Professor Grimshaw made some remarks at this point which he requested not to have reported . . .

President Rose: At the Council meeting yesterday we discussed that matter of tying the sections closer to the student groups, and that is to be taken care of.

Mr. Schroeder: Is it possible for the Association to do something along the lines of selling chemistry or the idea of it in those concerns that are at present not employing chemists? That is certainly a way of building up our membership for the future.

I certainly approve of research as part of the work of

the Association but now I think the Association should extend its publicity in some way.

Again I am not prepared to offer a practical means of doing that. I simply mention it.

President Rose: I think that is a good point, too, Mr. Schroeder. Of course, the whole object of the organization is to spread the doctrine that technical men are needed in the textile industry, and if any member can suggest a more obvious way then we are now following it is for him to do all he can to push that idea forward.

Is there anything else to be brought up?

Mr. Thompson: I move we adjourn.

. . . The motion was seconded and carried and the meeting adjourned at one twenty-five o'clock . . .

* * * *

The Business Meeting resumed immediately after the luncheon recess, President Rose presiding.

President Rose: The meeting will come to order, please.

The first business of the afternoon is the report of the Research Committee which we will have from Professor Olney.

Report of Research Committee

Beginning last year the publication of our Year Book was postponed until after the Annual Meeting in order that we might include in it the report of the Research Committee and also the reports of the various sub-committees which are working under its direction. The 1932 Year Book will be published early next year and for this reason I shall not, at this time, go into any great detail in regard to the work of the Research Committee, although I will mention a few of the outstanding features of the past year's work.

As most of you know we received an allocation of $5,000 from the Textile Foundation which was a continuation of a similar grant the previous year. With those funds we have been able to employ two research associates, one, Dr. Harris, who has been working at the Bureau of Standards in Washington, and the other Mr. Ryberg, who has been working at the Lowell Textile Institute. In addition, Mr. Smith, who has been our research associate for several years has been working at the Bureau of Standards.

Mr. Smith's work has been chiefly in connection with the work of the Committee on Light Fastness and also the Committee on Waterproofness. He is to present a paper later this afternoon covering some of his work so I will not go into any detail on that.

Dr. Harris has published three papers during the year, two of which have been on the subject of the iso-electric point, in one case of wool and the other case of silk, and he is at the present time continuing work with the object in view of adapting the principles which have been worked out through determination of the iso-electric point to the dyeing of wool with acid dyes and also carbonization.

The principle of electrophoresis has been an important factor in this work. As much of Dr. Harris' work has been published, and he is also going to speak later in the afternoon, we need not go into that further at this time.

One of the outstanding pieces of research work, as far as practical adaptability is concerned, is that which has been carried out by Mr. Ryberg under the direction of the Sub-Committee on Fastness of Dyed Wool. A paper has been published covering that work in the November 21st issue of the DYESTUFF REPORTER entitled, "The Development of a Laboratory Method for Testing the Fastness to Fulling of Dyed Wool."

For a long time it was believed that it would be impossible to duplicate in an experimental way the fulling test as carried out in the plant in the fulling mill. A laboratory method was devised some years ago by the Committee but two years ago we decided that this might, after all, be improved. Through the use of the Launder-Ometer and special adaptation of that piece of apparatus, which is fully described in Mr. Ryberg's article, we have found it possible to devise a test which is believed by mill men and dyestuff men to be not only a duplication of the actual fulling test but an improvement on it.

It will not be long before we will again go to the Textile Foundation for a continuation of our allocation of funds and we must present to them certain definite projects which not only appeal to them as being practical and desirable but they should be of such a nature that there is some possibility of accomplishing something definite on these problems during a year's time. They should also be of such a nature as to be of general interest to the members of the Association. I should like any of you who have subjects in mind that you believe will fulfill those specifications to send them to me because within a very short time we shall have to present our application to them and the more material we have to work on as a foundation for plans the more likely we are to work out something that will be acceptable.

We have, as you know, eighteen sub-committees which are working directly under the supervision of the Research Committee. I am not going to call for reports from all of these committees at this time but as several chairmen of sub-committees are in attendance at this meeting, we will hear from them.

Mr. Wm. H. Cady is the Chairman of the Committee on Light Fastness. I am going to ask him to present a brief report in regard to what his committee is working on at the present time.

. . . Mr. Cady presented the prepared report of the Sub-Committee on Fastness to Light . . .

Report of the Sub-Committee on Fastness to Light

Standards of Light Fastness. The situation in regard to standards is rather complicated. At the present time

we have three separate sets of tentative standards under consideration (all on wool). First, there are the original German standards recommended by the Echtheitskommission in 1928. Through the courtesy of Dr. Paul Krais, a member of the Kommission, a complete set of these standards on wool, cotton, weighted and unweighted silk, viscose and acetate silk was sent to us in 1931 and exposed to the sun and the Fade-Ometer at the Bureau of Standards. A brief report of these exposures was published in the AMERICAN DYESTUFF REPORTER May 23, 1932, in the Proceedings of the Research Committee. The conclusions reached by our Committee were that the standards on wool were in all respects the best, and with one or two exceptions might be used with reasonable satisfaction as standards for all fibers. Next, there are the tentative standards (on wool) selected by this Committee. As mentioned in our report at the last annual meeting, these are nearly identical with the German wool standards, but according to our tests they are more evenly spaced than the latter. Exposures to the sun of these American proposals have been in progress for over a year, but the end will not be reached before next summer. Meanwhile, with the co-operation of Dr. Barker, of the Wool Industries Research Association of England, a set of our standards was exposed to the sun in that country also. Dr. Barker's comments on these tests have been very helpful. Finally, the Echtheitskommission have recently offered tentatively an entirely new set of wool standards, which they consider superior to the 1928 offerings. Dr. Krais kindly sent us a set of these latest dyeings, which we are now exposing at the Bureau. It is interesting to note that these new proposals of the Germans correspond quite closely with a set of provisional standards recommended by Dr. Barker's committee in England. In short, there are now two separate and distinct groups of dyes proposed as standards, one group sponsored originally by the Germans and later by ourselves, and the other group sponsored by the English and more recently by the Germans. A report covering all of these efforts to standardize light fastness will be made sometime in 1933.

Fugitometer vs. Fade-Ometer. By the co-operation of the Bureau of Standards and Dr. Hall of the Ontario Research Foundation, a series of exposures has been conducted during the year, the purpose of which is to compare the quality of the fading produced by the English Fugitometer and the American Fade-Ometer with that of the sun, in order to determine which lamp is the better substitute. These exposures are now nearly completed and a summary of the results should be available in the near future. Your Committee has made several previous attempts to determine the relative merits of these two lamps, but the results were not conclusive.

The Effect of Finishing Materials on the Light Fastness of Dyes. At a meeting of the New York Section last spring, the suggestion was made that the Light Committee should investigate the effect of softeners and other finishing materials on the fastness to light of dyed fabrics. This Committee is not at present in a position to undertake any work along this line, but we desire to call attention to several excellent articles which have already been published on this important subject. We refer to the following:

"The Effect of Textile Softening Materials on the Fade-Ometer Fastness of Direct Dyes," Ernest Borho, A. D. R., Oct. 28, 1929, p. 699.

"Some Observations on the Action of Light on Finished Dyed Cotton Goods," P. G. Jones, J. S. D. C., June, 1910, p. 147.

"The Effect of Certain Softeners on Light Fastness," J. R. Hannay, J. S. D. C., Jan., 1912, p. 20.

"The Influence of the Finish on the Fastness to Light of Dyed Cotton Goods," E. Schmidt and B. Gabler, F.-Z., 1914, p. 153. Abst. J. S. D. C., June, 1914, p. 236.

Program for the Future. We plan to undertake soon a study of the effect of intensity of light on the quality of the fading. Various observers in the past have called attention to the abnormal fading produced when the light employed is much more intense than the sun, but many of our present-day observers appear ignorant of this fact. The subject is one which appears important enough to warrant further investigation. We also hope at some not too distant date to classify the light fastness of some of the dyes on acetate silk.

Prof. Olney: Mr. Howard D. Clayton is Chairman of the Sub-Committee on Shrinkage of Textiles. This subject has attracted much attention during the past two or three years and Mr. Clayton's committee has been doing some excellent work. Mr. Clayton is not here at the moment, but his report, which he presented at the Research Committee meeting yesterday, will be published in full.

Report of the Sub-Committee on Shrinkage of Textiles

At the annual report of this Committee submitted for the 1931 Year Book, a tentative method for determining shrinkage in cotton fabrics and a tentative method for determining shrinkage of woven silk fabrics was presented. Since that time the Committee has received communications constructively criticizing the method and has carried out a great many experiments testing the method and endeavoring to improve it.

The main difficulty which seems to be experienced with testing methods in general is for different laboratories to obtain check results. This is also true of shrinkage testing methods.

In its work during the past year the Committee has

tried to develop a method which would be shorter than the one proposed and one which would be sufficiently scientific and accurate enough for all practical results. For this reason a large number of washing tests have been carried out using 8 or 10 different methods suggested in which conditions such as temperature, time, speed of wash wheel and methods of pressing have been varied. With all these methods none has been found that will give complete shrinkage results in one washing; especially is this true on heavy fabrics such as twills, ducks and denims. Two practical test methods which give very satisfactory results in determining shrinkage are the Navy's wash test and the wash test of the Laundryowners National Association. The Navy's test is as follows:

Using weight of water equal to 50 times the weight of the material to be tested, the washing is performed in a cylindrical washer revolving in both directions. The soap bath is made up containing 5 grams of 88 per cent neutral chip soap and 2 grams of soda ash per liter of water. First bath, soap and soda temperature 100° to 105° F. for 10 mins. Draw off, add additional soap and soda, temperature 130° to 135° F. for 10 mins. Third bath, soap and soda temperature 165° to 170° F. for 10 mins. and adding in addition to the soap and soda 10 cc. of a 1% solution of hypochlorite of soda per liter of water. Fourth bath, hot rinse at 180° F. for 3 mins. Fifth, sixth and seventh baths are hot rinses at 180° F. for 3 mins. Eighth is a rinse with water at ordinary temperature. The samples are taken from the wheel by hand, squeezed out gently and placed on a screen to dry at ordinary room temperature. When dry, samples are pressed with a small laundry press. All samples are subjected to two complete treatments as above outlined.

The Laundryowners' method is very similar to the above except that the samples are subjected to a 5-min. break at 95° temperature in an .05% alkaline solution and then followed by 4 suds baths of 10-min. each, gradually increasing the temperature from 140° to 160° F. In the third suds bath hypochlorite bleach is added. The suds baths are followed by 5 5-min. rinses at 160° to 180° F. temperature and in the sixth rinse which contains bluing and acetic acid or some other laundry sour, the temperature is 90°. The samples are extracted in a centrifugal extractor and pressed on a laundry press. The samples are subjected to this treatment 3 times and shrinkage results are reported as in percentage after the third treatment.

It will readily be seen that both of these methods are too long for a satisfactory testing method which can be used by a plant laboratory to control the shrinkage of lots of work being processed, and it is the aim of the Committee to develop a rapid method which will give results comparable to those obtained by either the Navy or the Laundryowners' test.

In the Committee's study of various methods, tests were carried out on 7 different types of laundry wash wheels. Results were obtained which varied from .94% shrinkage to 4.5% shrinkage on samples of the same materials using the same washing methods in all cases. These results very forcibly emphasize the importance of adopting a definite type of wash wheel for carrying out such tests. The work of the Committee is being extended along these lines.

Prof. Olney: Since the last meeting two new subcommittees have been formed, one a committee on sulphonated oils, their analysis and classification. Mr. Hart, the Chairman of that Committee, is in attendance at the meeting, but does not appear to be in the room at the moment. They have also done excellent work. He has a rather large and active committee and I think credit should be given to Mr. Hart and also to his Committee for their commendable work. They are right in the middle of their work and I think it will be another year before they are in a position to present complete official methods for adoption.

Another new committee which is in the process of formation has Dr. Harold for its chairman. They are going to work on standard methods of chemical analysis and testing as applied to the textile industry. There is an opportunity for very extensive and valuable work.

Before I close I should like to say something about the possibility of extending our research work here in the South, and I am glad Professor Grimshaw is here because I think perhaps what I am about to propose may appeal to him.

It seems to me that some of the Southern textile schools might well have subcommittees of our Research Committee working through the head of the department and perhaps reporting from time to time their results to the Research Committee, and have that work published in the DYESTUFF REPORTER. They would of course select such subjects as might be of interest to them and upon which they could work to advantage and in that way perhaps eventually each of the Southern educational institutions that are interested in textile work, particularly dyeing and finishing, might have a subcommittee of their own working on their own independent problem, adapted to their own uses, and they would have full credit as a subcommittee of our Research Committee and report through the latter body.

I should like to have Prof. Grimshaw's reaction to such a proposition.

Prof. Grimshaw: Dr. Olney, I said a few words this morning along this line. At that time I expressed my entire willingness to come in on such a proposition. The Piedmont Section have a chairman now in Mr. Thompson,

who might be able to get from the Council some of the problems which you want work done on, and if we can do them at our school we will be glad to, I know.

I had the pleasure this noontime of meeting Dr. Manning, of Clemson. I notice he is in the room and maybe he can speak for that institution. I don't know whether Georgia State or Auburn are represented here but I will be glad to get in touch with them. Dr. Manning can speak for himself. Dr. Willis of Clemson I notice is also here and he can most likely speak for Clemson.

Prof. Olney: I should be glad to hear briefly from any of them.

Dr. Manning: All I can say is that I am new at Clemson but I shall be glad to talk the matter over with Prof. Grimshaw and if there is anything we can do along this line we shall be glad to make arrangements to do it.

Prof. Olney: I hope that plans may be worked out so that by another year we will have two or three active subcommittees of that type. If the work is supervised by the head of the department or one of the professors, I should think much of the work could be done by senior students.

The Year Book Committee should present a report at this time.

Report of Year Book Committee

(*Prof. Olney. Continuing*) It is planned to publish another Year Book for 1932 and as I have already stated we have it in mind to publish that as early in 1933 as possible and include in it anything of special interest which develops at this meeting.

I think you all understand that this Year Book is supported by the advertising. It costs just about $2,000 to publish and print something like 1,500 or 1,600 volumes, and unless we get that amount of advertising we will go into the red on it as we did last year to some extent. I simply say this knowing that you are all interested and anything that you do to aid in increasing the advertising is a direct help to the Committee and will also make it possible to publish the Year Book continuously.

I think that is all, Dr. Rose.

President Rose: Thank you.

You have heard Dr. Olney's report for the Research Committee, and I should like to emphasize to the membership—it is really something that should be emphasized to every member—that the heart and soul of this Association is right in the Research Committee and that anything any individual member can do to promote the welfare of that Committee is well worth doing.

It so happens that Dr. Olney also mentioned the Year Book and that also is a feature that has done more to make members feel that the Association really amounted to something that a great many other activities, that might have been more spectatcular but less valuable, could have done.

I think we have been astonishingly fortunate, and perhaps the younger members don't appreciate how fortunate, in having Professor Olney as Chairman of the Research Committee.

You have heard this report. What is your pleasure?

. . . Upon motion duly made and seconded, it was voted that the report be accepted . . .

President Rose: That is essentially all that comes before the Business Meeting. I should like, however, to make two announcements before we go into the scientific program.

In the first place, it is usual to announce the arrangements and plans for the next Annual Convention. At the Council meeting it was decided to make rather an innovation next year. We have accepted the invitation of Chicago to hold the next convention meeting there and inasmuch as the American Chemical Society is to meet there the first week in September and inasmuch as the meeting will have the added attraction of being in a city where they have the most modern fair that has ever been, we thought it would be wise to hold our convention at the time when the Exposition is open. That means we will have to separate our Annual Meeting from our Convention Meeting and that is what we propose to do.

The exact date of the meeting in Chicago is left open. It will be arranged, with the advice of the Chicago Section, and then the Annual Meeting will take place in New York the first week in December.

There is one further announcement: As you know it has been customary to give prizes for the best papers read before the Association in the course of the year. This year, because of the reason that underlies most changes in plans, we have decided to defer taking any more money out of the treasury even for so entirely good a cause as these prizes. The arrangement will be suspended, for this year only.

Does anyone wish to bring up anything else before we go into our technical program? If not, we will go on with our program of papers.

. . . The Business Meeting thereupon adjourned . . .

CALENDAR OF COMING EVENTS

Meeting, Research Committee, New York, January 27th.

Meeting, Council, New York, January 27th.

Meeting, New York Section, Elmwood Country Club, Paterson, N. J., January 27th.

Winter Meeting, Piedmont Section, Poinsett Hotel, Greensville, S. C., January 28th.

Meeting, Philadelphia Section, Pennac Capers Room, Penn Athletic Club, Rittenhouse Square, Philadelphia, Pa., January 27th.

Annual Meeting, Chicago, September 1933.

Proceedings of the American Association of Textile Chemists and Colorists

The Building of Molecules for the Textile Industry

By **R. E. ROSE**
E. I. du Pont de Nemours & Co.

DESIGNING molecules is a great art as well as a great science. It is a very useful accomplishment, not only in the laboratory, but because of its relation to industry. In no field, except perhaps that of medicinal products, has the activity of the organic chemist been greater than in that of materials being used in the textile industry, more particularly of dyes.

The success of Lancashire as a textile center was due to the invention of a molecule and a machine. This first artificial textile assistant was made from calcium, chlorine and oxygen. It had no natural analogue yet it had the effect of bringing sunshine into the smoky air that the new spinning and weaving machines were producing. Not real sunshine, more's the pity, but something that bleached cotton as though the sun and air had acted on it in the fields. As a matter of fact cotton was considered white enough without bleaching and it was linen that was subjected to the action of air, lye and sour milk for six months in order to whiten it; but when bleaching with chlorine was introduced it set a new standard for cotton whiteness. Chlorine itself was discovered in 1774 by a modest school teacher, who was also a scientific investigator, the Swede, Scheele. His discovery was the starting point for developments that have had more influence on the history of the world than all the wars of Napoleon. Inasmuch as Scheele's work was constructive, he is buried as the ordinary common citizen and not in a shrine as seems to be usual with destructive geniuses. Scheele discovered chlorine, Berthollet suggested using it for bleaching and Tennant put the suggestion into practice. Tennant in 1798 used lime and chlorine and later invented dry chloride of lime.

One of the earliest organic molecules of immense importance to the dyer was Turkey Red Oil, discovered in 1875. It was preceded by sulfoleic acid, which it displaced. Before that, to produce the red shades of Turkey red, rancid olive oil was employed; this formed an emulsion with alkali.

It is, however, when we turn to dyes that we find the organic chemist in his element, building molecule after molecule, examining the structure and modifying it in order to get what he wants. The great rush started in 1856 and was due to a discovery as casual and as unexpected as that of gold on Sutter's farm in California. It did more I think to change the course of civilization than even the rush for gold of '49. It gave rise to a new industry, encouraged the rapid development of a new science and changed the very aspect of our surroundings.

How does the organic chemist proceed? What is the plan by which he works? The plan that is to him what the blueprint is to the engineer and architect. It is the graphic formula which shows where each atom in the molecule stands with respect to its neighbor. Thus (Fig. 1) represents indigo and tells us how carbon is linked

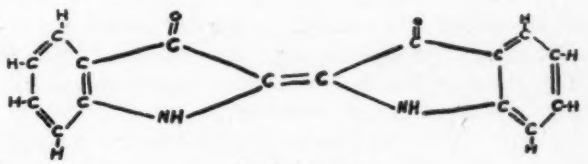


Fig. 1—Indigo.

to carbon and the relative positions of hydrogen, oxygen and nitrogen. It is easy to read such a formula and eas to write it. Perhaps too easy because we are apt to forget what an immense amount of painstaking research was necessary before we could draw such a picture. Behind it we have the minds of such men as Dalton, Berzelius, Avogadro, Hofmann, Dumas, Kekule and Victor Meyer. The blueprint is built on the conceptions of atoms, of molecules, the determination of atomic and combining weights; the breaking down of molecules which is analysis and the building of them, which is synthesis, and above all with the guidance of man's intelligence taking flight in the field of speculation and imagination, in a field limited by logic and a love of truth, which is no limitation.

In that most painstaking and elaborate compilation, the Color Index, of the Society of Dyes and Colorists, there are listed 1230 dyes, leaving out of account those of unknown constitution, multiply the number by 1000 and the result will be below the multitude of different molecules made in searching to get dyes worthy of list-

*Presented at Annual Meeting, Saturday afternoon session, Dec. 3, 1932.

ing as commercial products. At first the search was very poorly organized, and it did not actually have to be any better because the field was so rich that any effort, no matter how casual, was rewarded by a measure of success at least. Moreover, as in every new field the available information did not allow of planning a deliberate route to a desired objective. Little by little this changed as our knowledge grew and now we can predict with reasonable certainty what characteristics a dye will have before we have done more than sketch its structural formula. Our only limitation is the available material from which to build the molecule. New intermediates are not as readily produced as new dyes and the simplest, cheapest ones have all been made these many years. In designing a new molecule we are almost as circumscribed as the architect is by the nature of his building materials. It is only the millionaire who can go outside of the usual for material in building his home, and few dyes are so very much better than others that they can command a price sufficient to pay for the building of special intermediates. Remember always that a dye, though it may be defined academically as a colored body having affinity for a substrate, is in practice only a dyestuff if it can be sold. So it goes that the dye chemist can not always put into effect plans that he can draw.

Twelve hundred and thirty different dyestuff molecules are in this list of commercial products of known constitution, many of them are, of course, obsolete, but to offset those there are hundreds of others whose constitution is not a matter of general knowledge.

Contrast this with the 18 natural dyes that were all that man found in nature and you will realize better how much of an art dye making has become.

In the course of the years since 1856 the chemistry of dyes in relation to the uses made of them has become so well worked out that we have come to read into a formula not only the color but the dyeing properties. Some of these facts are known in a way to the dyer, because to some extent he calls his dyes by their chemical class names, sometimes without knowing much more than

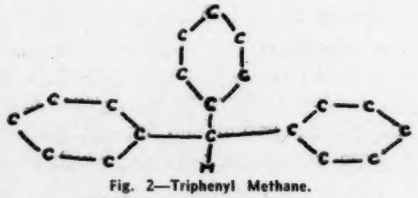


Fig. 2—Triphenyl Methane.

the name. He knows that basic colors are very brilliant, very fugitive, not substantive, and not destroyed by discharge agents, but he does not know the rules for going through the many changes in hue of which the group is capable.

Triphenyl methane, (Fig. 2) the parent substance of one group of basic colors, is colorless. Convert it into a base by introducing two dimethyl-amino groups and the resultant molecule is Victoria Green, replace the methyl with ethyl groups and the shade becomes brighter, yellower, changing to that of Brilliant Green. Nothing greener can be made from this type of molecule. (Fig. 3 and 4).

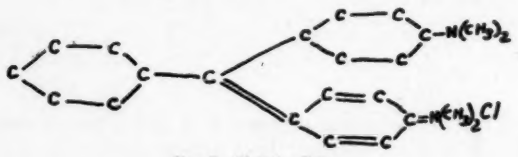


Fig. 3—Victoria Green.

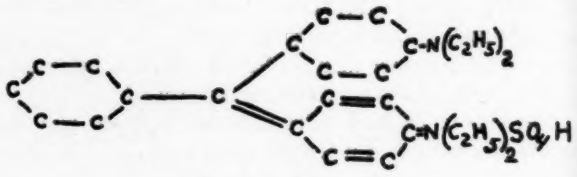


Fig. 4—Brilliant Green.

Build the molecule with three amino groups and you have achieved the greatest redness possible in a triphenyl methane molecule, Magenta. (Fig. 5).

Fig. 5—Magenta

Alkylating the amino groups imparts increasing blueness, the penta-methyl dye is Methyl Violet, the purest violet that can be made and the hexa methyl derivative is Crystal Violet which is bluer. (Fig. 6 and 7).

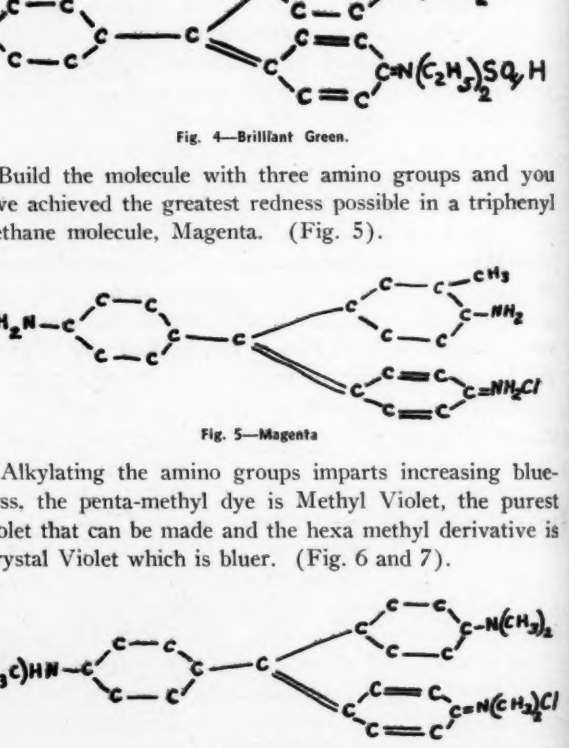


Fig. 6—Methyl Violet.

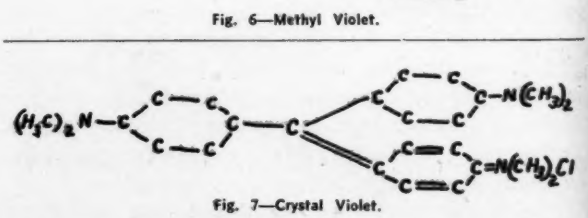


Fig. 7—Crystal Violet.

But in no way can we leave the spectral limits of blue-green to violet within the triphenyl methane series. However, by dropping out one phenyl group we achieve a yellow, Auramine. (Fig. 8).

For brown and oranges we must go elsewhere, to the basic azo colors, different entirely in structure.

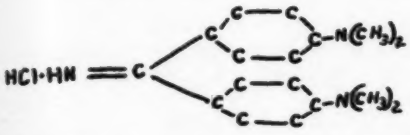


Fig. 8
Auramine.

We must, however, have blues and reds, if we are to have a full line of brilliant dyes, and these must dye in the same way. For basic reds we have to go to the azine or xanthene dyes. These are built around the structures (Fig. 9) the first of which by a stretch of the imagination may be regarded as a kind of triphenyl methane with a central nitrogen in place of carbon and linked over again by nitrogen to give another six membered ring. This when it is elaborated by putting into it two NH_2 and two CH_3 groups gives Safranine T, the reddest of the purely basic colors. (Fig. 10).

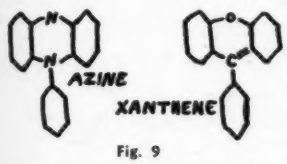


Fig. 9

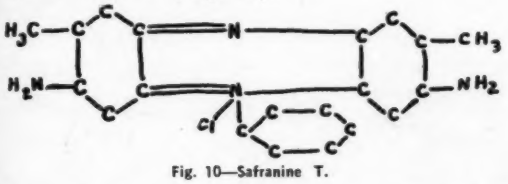


Fig. 10—Safranine T.

The xanthene ring is actually a variant of the triphenyl methane molecule, two phenyl groups of which are linked through oxygen. This is the parent molecule of Rhodamine B, a dye having (Fig. 11) an acidic as well as a

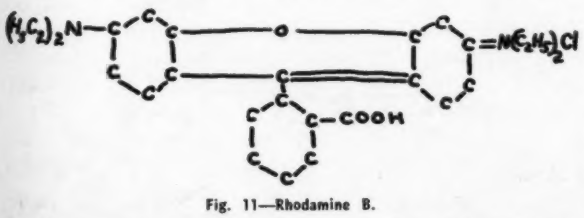


Fig. 11—Rhodamine B.

basic character, which accounts for its divergence from the character of the typical basic color. If the acidic group is plugged by esterification a more basic molecule is produced and at the same time the color shifts to the yellow to give Rhodamine 6G. (Fig. 12).

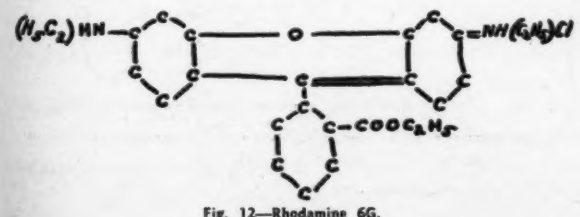


Fig. 12—Rhodamine 6G.

The best basic blue is a thiazine color, Methylene Blue, though the substitution of naphthalene for a phenyl group in triphenyl methane does enable us to make a very good blue, but redder, Victoria Blue B. (Fig. 13, 14 and 15).

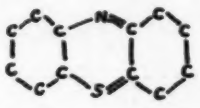


Fig. 13
Miazole Ring.

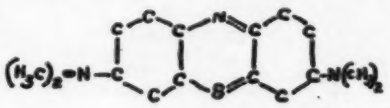


Fig. 14
Methylene Blue.

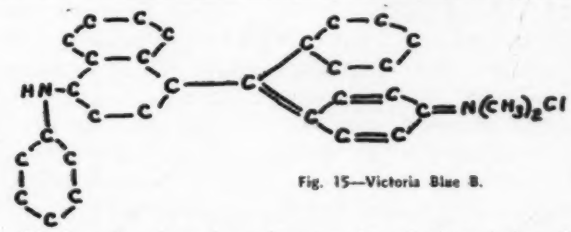


Fig. 15—Victoria Blue B.

If the phenyl or benzyl group is substituted for the methyl then sulfonation can be effected and thereby a whole new group of dyes produced, no longer basic colors but brilliant acid colors, violets, red violets, and blues like Alkali Blue. (Fig. 16).

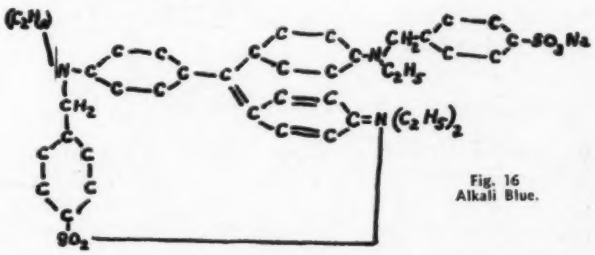


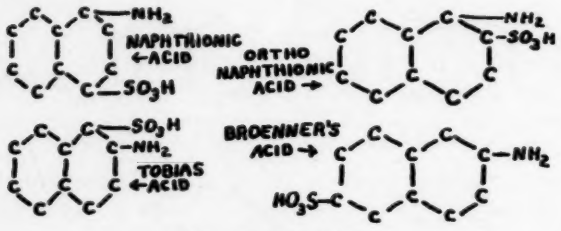
Fig. 16
Alkali Blue.

In all of this the restrictions upon the organic chemist are quite irksome, he can not do much more than I have told you and still keep the molecule with the characteristics of a usable basic or acid triphenyl methane color. It is when he works in the group of azo colors that his activity is almost unlimited. Azo dyes are not in general built by varying the groups in a substituent but by hooking together molecules that have a diazotizable group with another that has a replaceable hydrogen or in other words practically any amine no matter whether it is a derivative of benzene or naphthalene, and any phenol or naphthol is available as a unit in the molecular structure. Also the sulfonic acids of these bodies are available.

Remembering that the number of isomeric naphthol sulfonic acids and of naphthylamine sulfonic acids is 14 of each and that each isomer produces a dye differing slightly to greatly from the other the richness of the field becomes apparent.

I have here four dyeings made to show the effect of such simple isomerism as the moving of a single amino and sulfonic acid group in the naphthalene ring. (Fig. 17, 18, 19 and 20).

All four dyes are made from beta naphthol but this is coupled with four different mona-amino-sulfonic acids, naphthionic acid, ortho-naphthionic acid, Tobias acid and Broenner's acid.



Figs. 17, 18, 19 and 20.

Boettiger discovered in 1884 that one molecule of tetrazotized benzidine coupled with two molecules of naphthionic acid produced a red which dyed cotton directly. (Fig. 21). Before that it was assumed that

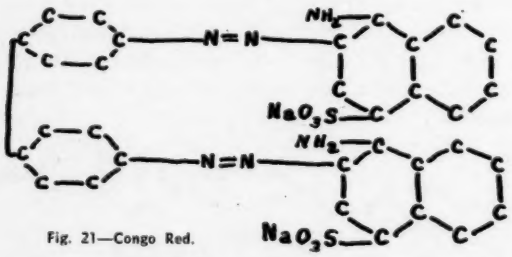


Fig. 21—Congo Red.

no artificial dyestuff would dye cotton except on a mordant. This was the first real step forward in getting a greater affinity of a water soluble dye for cotton. It is true that this was not the first direct color made, but the first one to be used, as it was only after this discovery that Sun Yellow was found to be substantive. (Fig. 22).

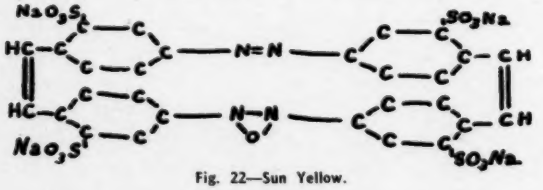


Fig. 22—Sun Yellow.

This character of substantivity is one of which we know comparatively little, although recently our progress in learning more about it has been more rapid. Substantivity is conferred on the dye by the presence of certain groupings, for instance practically all the benzidine colors are direct dyes as are also those derived from tolidine (Fig. 23) which is benzidine with two extra methyl groups in it, a difference which makes the resultant color a little bluer and a little faster to acid. Two methoxy groups can also be introduced into benzidine without altering the substantivity of the dyes made from it. This substitution allows of introducing a very marked shift toward the blue in the dye molecule. For instance the difference

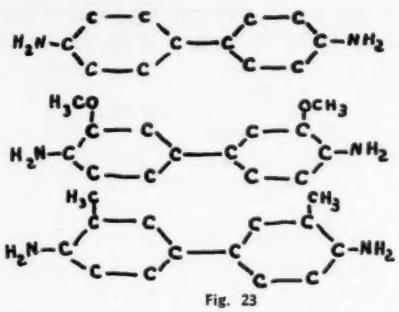


Fig. 23

between Congo Red and Benzo Purpurine 10B is only in the two methoxy groups, and the direct sky blues are derivatives of dianisidine. (Figs. 24, 25, 26, and 27.)

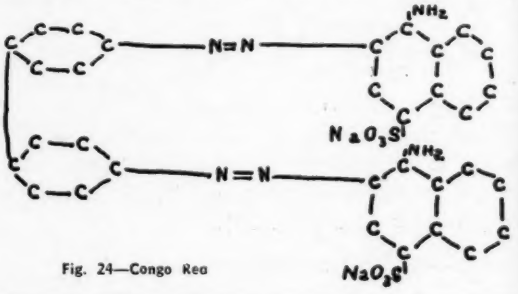


Fig. 24—Congo Red

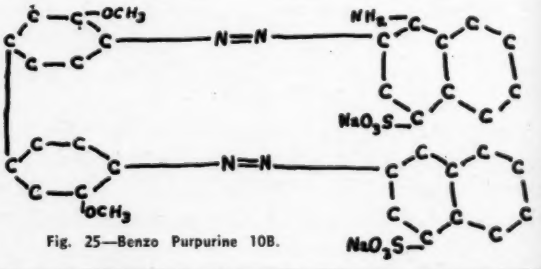


Fig. 25—Benzo Purpurine 10B.

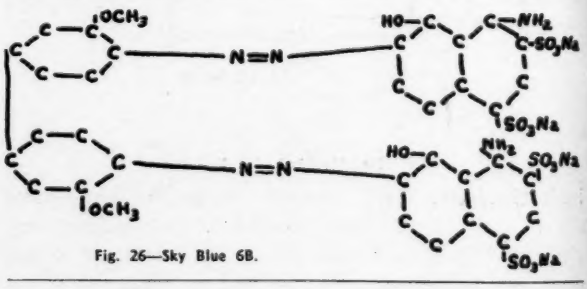


Fig. 26—Sky Blue 6B.

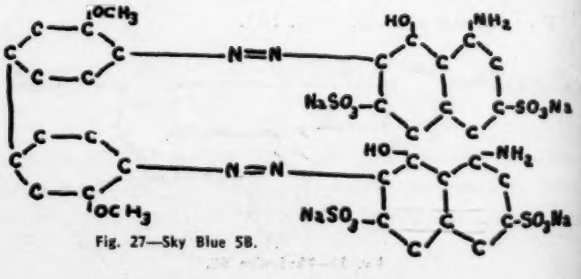


Fig. 27—Sky Blue 5B.

The stilbene nucleus (Fig. 28) also confers substantivity and it has been suggested that there is a certain definite shape to molecules that makes them fit into a cotton fiber.

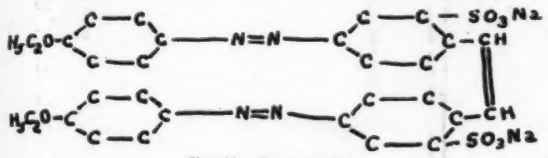


Fig. 28—Chrysophenine

This seems to hold but it holds only if you restrict your generalization to certain groups, which means it really does not hold at all, because a color like Toluylene Brown, (Fig. 29) which is capable of dyeing cotton very fast to

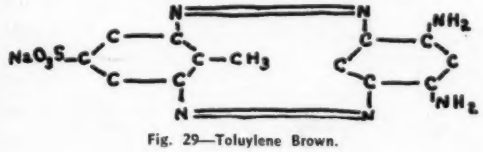


Fig. 29—Toluylene Brown.

soap, is certainly not in any way a long slim molecule like benzidine or stilbene. In a sense the same is true of the dehydro-thio-toluidine colors. (Fig. 30).

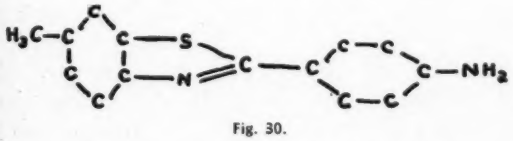


Fig. 30.

On the other hand the phosgenated J acid (Fig. 31)

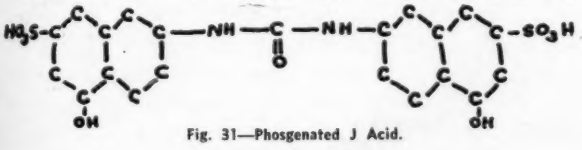


Fig. 31—Phosgenated J Acid.

derivatives, (Fig. 32) which are substantive, may possibly be called "long chain" molecules. As a matter of fact

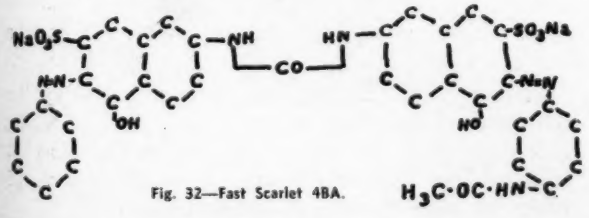


Fig. 32—Fast Scarlet 4BA.

the most substantive of all dyestuffs are the leuco bodies of the vat colors, which are not to be described, no matter how we twist the formula, as possessing long slim configurations. (Fig. 33).

The hunt for substantivity has been very active and the dye chemist has done some of his best work in increasing fastness to washing. This he has done, as you know, by using a comparatively simple molecule and making it more complex on the fiber, as in the case of the diazotizable dyestuffs, or he has taken practically colorless bodies, with very little affinity for the fiber, and coupled these with diazotized bases which unite with them to form extremely water insoluble products. The best example of this development is in the naphthol series of colors, and these I had the pleasure of describing to you at one of our earlier meetings. It represents an admirable example of the control of the chemist over molecules when he wishes to secure definite results.

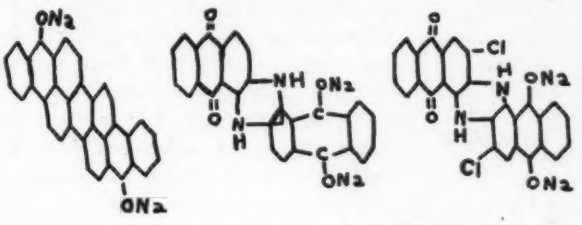


Fig. 33—Leuco Bodies of Vat Colors.

The azo colors are just as important for wool as for cotton, perhaps more so, and I should like to emphasize the evolution of molecules for the dyer by referring to the progress made in securing a really fast black on wool.

The other day I saw an evening cloak of black woolen broadcloth that was dyed thirty years ago. It was still a most beautiful, full, bloomy black. It was dyed with logwood. Now logwood, which became available to European dyers shortly after the Spanish conquests in America, produces a magnificent black, if it is properly dyed, but that means using 25 per cent of hematine, and the process is not cheap. If the dye is skimped and only 12 per cent is used, the necessary fullness being built up by the addition of red and yellow, then the black is really very poor. It greens. This is one reason why logwood was displaced, though I must admit that even the best logwood is acid sensitive.

The first chrome black to come of the organic chemist's molecule building was Alizarine Black SW, which is dihydroxy (Fig. 34) naphthaquinone. This compound was discovered in 1861 but was useless as a dye because of its insolubility. Later in the form of the soluble bisulfite compound it became an extremely valuable black.

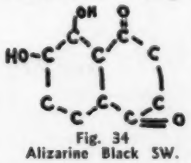


Fig. 34
Alizarine Black SW.

The first azo chrome black was put on the market the same year. It was made from amino-salicylic acid-alpha-naphthylamine and Neville-Winther's acid. It was the first of the Diamond Blacks, Diamond Black F. (Fig. 35). It was not very fast to potting, nor to light, and it stained white cotton quite badly but it was soluble enough and it was easy to use so that it was quite successful from the start.

The very same year the rival firm of Cassella introduced Anthracene Chrome Black F, which was nearly the same thing as Diamond Black F, and I suppose it disappeared in consequence of some arrangement between the two firms. You will notice that this second azo chrome black, like the first one, was an ortho-oxy-azo dye: (Fig. 36).

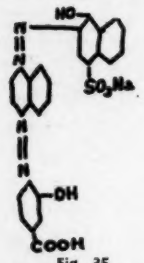


Fig. 35
Diamond Black F.

Molecule building from the commercial side is governed by competition, and it is not surprising to find that whenever a new field is opened and the original discovery

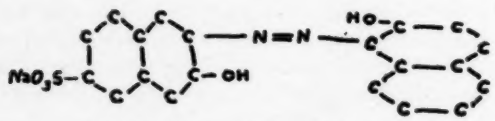


Fig. 36—Anthracene Chrome Black F.

protected by a patent, all sorts of means are studied of getting the same result in a different way. In 1890 the Hoechst Plant brought out Alizarine Black P. (Fig. 37). This was inherently too expensive being a complicated anthraquinone derivative, and it was really a better printing color than anything else. The same firm in 1891 brought out Acid Anthracene Black ST, which again was an azo dye. (Fig. 38). This you will notice has in it the same grouping, as far as the hydroxyl and azo group

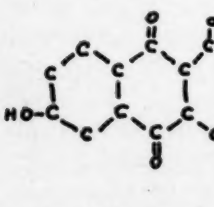


Fig. 37—Alizarine Black P.

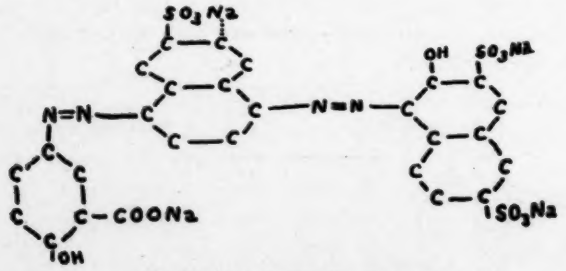


Fig. 38—Acid Anthracene Black ST.

are concerned, as Diamond Black F, and we shall see that all the chrome blacks are characterized by this atomic arrangement. Acid Anthracene Black ST was soluble enough to be quite level dyeing and was used on piece-goods. It was, however, not quite fast enough to potting to meet the desires of the woolen trade. Three years later the Bayer Company were able to put on the market the first alizarine derivative produced by their anthraquinone expert, Schmidt. This was Alizarine Blue Black B: (Fig. 39) which was very level dyeing and excellent for grays

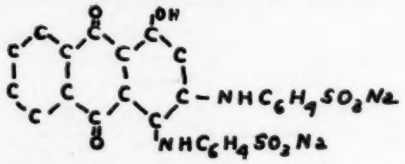


Fig. 39
Alizarine Blue Black B.

and slates but rather too expensive for blacks. In fact it was difficult to get a good black with it.

In 1898 Durand and Hugenin introduced their contribution to the chrome blacks, christening it Azo Alizarine Black I: (Fig. 40). It was a good soluble black, fast to

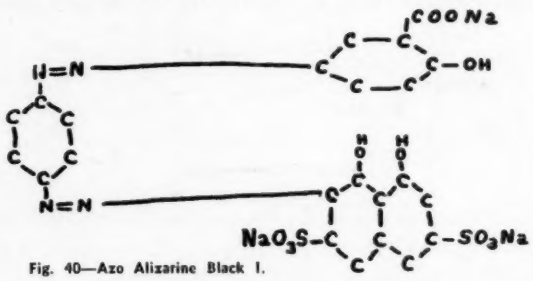


Fig. 40—Azo Alizarine Black I.

light but not to milling. It never had very much success, whether that was due to its inherent properties or to the commercial situation I am unable to say. Next came the English firm, Read, Holliday & Co., who in 1899 brought out Chrome Black I: (Fig. 41). This you

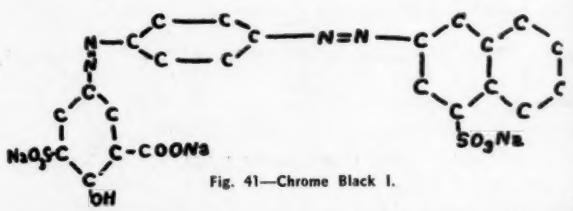


Fig. 41—Chrome Black I.

will notice is even closer to the structure of Diamond Black F, then Acid Anthracene Black ST being identical except for one more sulphonic acid group. It gave a good fast black.

The first year of the 20th century was marked by the exploitation of several azo chrome blacks. Acid Alizarine Black SE: (Fig. 42) which originated in the Hoechst Plant, was not very level dyeing. However, it covered silk and for some special purposes was used.

Acid Alizarine Black SN: (Fig 43) made by the same firm was more successful. It was readily soluble and could be used in machine dyeing. It was much too unlevel dyeing for piece-goods.

The Badische Company's chief contribution of that year was Alizarine Black WX: (Fig. 44) which is an excellent color for piece-goods, yarn and slubbing. It is very interesting to note that this is no other than a

variant of the first artificial chrome black, Alizarine Black SW.

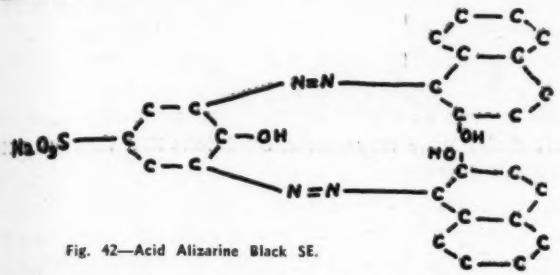


Fig. 42—Acid Alizarine Black SE.

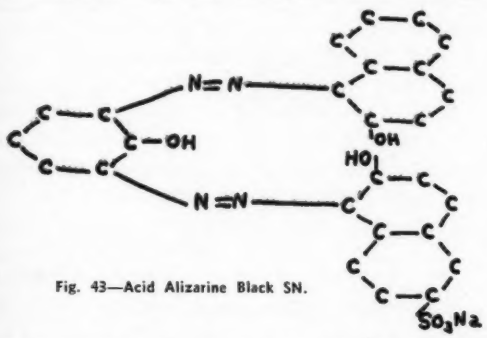


Fig. 43—Acid Alizarine Black SN.

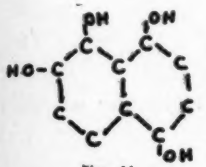


Fig. 44
Alizarine Black WX.

Acid Alizarine Black R. (Fig. 45) was another dyestuff of that year. It was not very level dyeing, not very fast to potting and stained silk, but it was a good vigoreaux black.

After this outburst two years passed before any new colors were announced and then Diamond Black PV of the Bayer Company started on its triumphant career: (Fig. 46). It exceeded all its predecessors in fastness to potting and it was a first-class color for hat felts. It had only one very serious objection and that was its extreme metal sensitiveness. It is still considered a good chrome black.

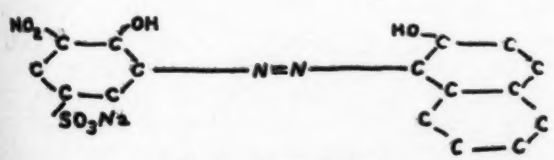


Fig. 45—Alizarine Black R.

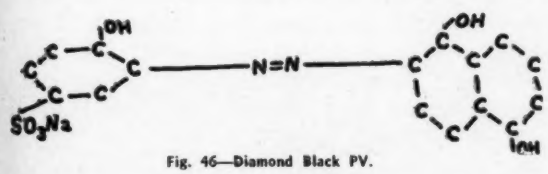


Fig. 46—Diamond Black PV.

Again two years passed and then the Swiss firm of Geigy produced the first representative of a group of chrome colors that have become more important than any others. Derivatives of 1-amino-2-hydroxy-naphthalene-4-sulphonic acid. This intermediate when coupled with beta naphthol gives a dye which on afterchroming develops to a beautiful blue black which does not appear reddish in artificial light. Moreover it dyes from a very weakly acid bath, which is not true of any of the chrome colors previously invented. When the same intermediate is coupled with alpha-naphthol, Erio Chrome Blue Black R is produced (Fig. 47-48) which is redder than the B brand, less fast to potting and quite copper sensitive.

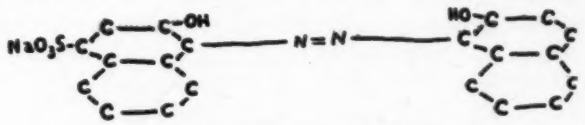


Fig. 47—Erio Chrome Blue Black B.

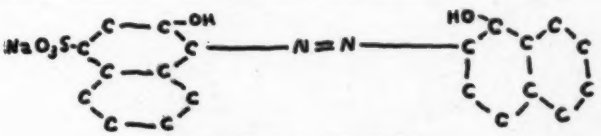


Fig. 48—Erio Chrome Blue Black R.

If instead of using 1-2-4 acid, nitro-1-2-4 acid is employed, then the azo dye made with beta naphthol is a real black, Erio Chrome Black T, of excellent fastness: (Fig. 49)

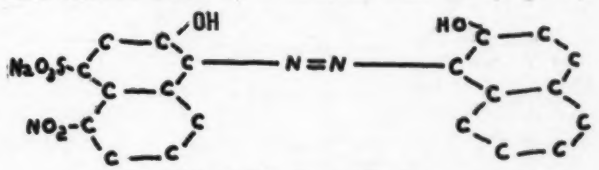


Fig. 49—Erio Chrome Black T.

while the same intermediate coupled with alpha-naphthol produces Erio Chrome Black A, very soluble, and among the very best of the chrome blacks. (Fig. 50). These last four compounds have in this country very largely displaced all other chrome blacks. It is not that they are essentially better in the final dyeing, but they have a real affinity for wool, even in a weakly acid bath, and, therefore, they can be used in equipment that would not stand up under the action of the stronger sulphuric acid solution necessary to drive on the older chrome blacks. The tendency in this country has been to machine dyeing and the less acid you use in metal machines the better.

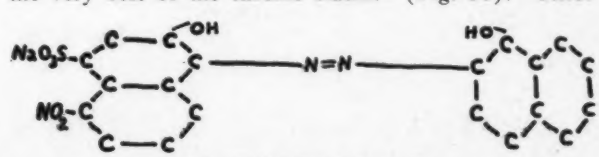


Fig. 50—Erio Chrome Black A.

The colors are very high in tinctorial value so that they seem to represent, for the time being, an end point in the chemist's designing of molecules producing chrome blacks by afterchroming. However, already new molecules are coming in which are azo colors into which the chrome has been placed so that when wool is dyed from an acid bath the color carries the chrome necessary for chroming it into the fiber, then a subsequent boiling produces a real lake. Colors of this class offer a great many attractive features. The first of this series suffered from the objection of the necessity of using a high acid concentration in the dyeing. That difficulty is being overcome by the chemists who are working on this problem, so that it may be that in a few years from now colors of this class will displace the older chromeable blacks.

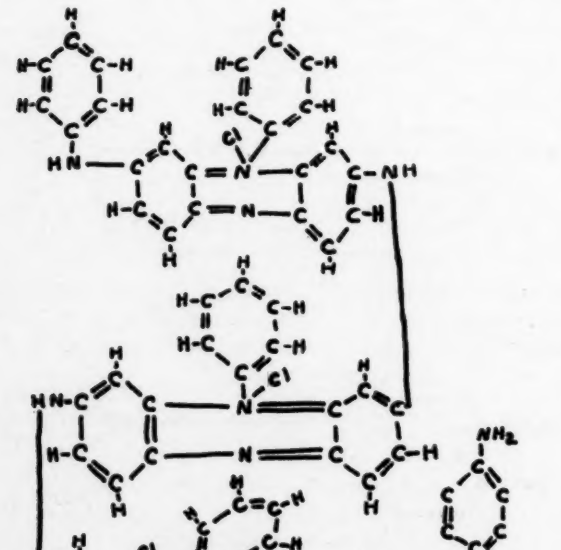


Fig. 51—Aniline Black.

I cannot go into the subject I have chosen in anything like detail, it is far too embracing. However, let me remind you that the discovery that pigments containing two carbonyl groups between two benzene nuclei, in other words, pigments derived from anthraquinone, could be converted into soluble bodies by alkali and sodium hydrosulphite, has given us the finest colors we have yet been able to secure, the anthraquinone vat dyestuffs. These, as leuco bodies, are astonishingly substantive and when once they undergo oxidation are practically part and parcel of the fiber. I think that within the next few years we shall learn far more about the real meaning of substantivity than we know now, and as usual, as we learn more we shall profit by doing so and find ourselves able to make better molecules, or use those we have to better advantage. I am not so sanguine about fastness to light, but even there I think we shall be able to do a great deal, and actually, even now the fastness of dyestuffs is plenty good enough to satisfy all the usual requirements, it is only under some very special conditions that they are apt to break down.

In conclusion let me tell you that while molecule building is really quite a specialty and quite restricted to the privileged class of chemists when it comes to dyestuff synthesis, yet the making of complex molecules is really not at all hard. Every man in this room who has ever made a print or a dyeing with aniline black has converted the simple little molecule of aniline with its 6 carbon atoms, 7 hydrogen atoms and 1 nitrogen atom, into a molecule which the analytical expert tells us contains, as I show you on the screen: 66 carbon, 48 hydrogen, 11 nitrogen and 3 chlorine atoms. (Fig. 51)

Discussion

President Rose: The next paper on our program is one that takes us back to the days before these molecules of which I have spoken were used. It is entitled, "The Culture of Indigo in the South," and will be presented by Prof. J. E. Copenhaver of the University of South Carolina.

Prof. J. E. Copenhaver: Mr. President, Members of the American Association of Textile Chemists and Colorists: After hearing Dr. Rose chase groups of sulphonic acid, ethyl, etc. around the benzine ring, it is with much temerity that I come before you and bring up a historical subject, in other words, bring out some of the skeletons and rattle them. We sometimes forget the history of some of these molecules which we use from day to day.

A few years ago I became interested in indigo culture in this country—this was after going to the University of South Carolina—and suggested it as a paper, which I am to present today.

In bringing this paper of historical interest before you, after listening to these other technical papers, I am reminded of a story which I heard a few days ago. It seems that a famous hunter had come to town and one of the townsmen asked another, "Have you heard John Smith lecture on his hunts?"

The other fellow replied, "Yes, I listened two weeks to him one night." (Laughter)

So it may be that you will listen about three or four hours to me in the next twenty minutes.

. . . Prof. Copenhaver presented his prepared paper.

Proceedings of the American Association of Textile Chemists and Colorists

The Culture of Indigo in the South

By J. E. COPENHAVER

Department of Chemistry, University of South Carolina, Columbia, South Carolina.

SINCE the manufacture of synthetic indigo has almost completely supplanted the culture of the indigo plant, very few American chemists of today are aware of the fact that it was cultivated and exported in large quantities during the first century after permanent settlement. The revenue derived from this commodity has played a very important part in the development of the cultural and governmental structure of what are now three southern states, South Carolina, Georgia, and Louisiana.

The late Professor B. B. Ross, of Alabama Polytechnic Institute, in 1922, published some notes[1] on the culture of indigo in the south and in 1930, the writer published an article[2] concerning its cultivation in the Provinces of South Carolina and Georgia, taking up in detail its method of extraction and preparation for the market. The substance of that article is included in this paper, with additions to include Louisiana.

There is plenty of proof that indigo was known and used as a dye by the ancients, for in Samskrit we find methods described for its preparation and Egyptian mummies are found wrapped in cloth which was colored with this dyestuff. It is not definitely known by what route the plant was brought to the western hemisphere, but the most plausible explanation is that it was carried from Europe to the West Indies, where it was acclimated, and afterwards introduced into the colonies of the continent.

Of the three colonies producing natural indigo, South Carolina was the largest and from the records in that state we get most of our early information. For that reason, the production in that province will be considered first.

Culture in South Carolina

The first permanent settlement in South Carolina was made in 1670 at Charles-Town, forming a part of a grant from Charles II to eight of his supporters, known as Lord Proprietors. Soon after the establishment of a permanent colony, experiments were made to determine what commodities would best be suited for the new country. Among these were rice, indigo, silk and cotton, each of which has played an important part in the export trade and development of the country.

The first introduction of indigo into South Carolina is not actually known, but it was probably about 1690, the approximate date for the advent of rice in the colonies. Evidence to support the fact that indigo was one of the products of the young colony is that in 1690 there is on record[3] a request of the people to be allowed to pay their rents in silk, cotton, rice, and indigo, and an act was ratified to that effect on March 16th, 1695-96, by the General Assembly. However, very little attention was given indigo until about 1741-44. In 1741 or 1742, Miss Eliza Lucas wrote to her father[4], then Governor of the island, Antigua, for seeds to plant on his plantation near Charleston. Among these seeds was indigo. She was interested in finding some crop that would prove a valuable product to the comparatively new country and with the encouragement of her father, she made a sort of an experimental station of their plantation. Her first crop of indigo, planted in March, was killed by frost; her second, planted in April, was destroyed by "a worm"; but her third reached maturity. She reported her success to her father, and the next year more seeds were sent as well as a man who was experienced in the process for extracting the dye from the plant. This man, not wishing to jeopardize the French West Indies trade in indigo by showing the American colonists their method, attempted to make a mystery of the process of extraction and prepared an inferior product. However, Miss Lucas suspected his treachery, dismissed him, and with the assistance of a neighbor, Mr. Devereaux, carried out the process and obtained a very good dye. She married in 1744 and her father gave the whole crop on his plantation to her husband as an example of her industry. This crop was allowed to go to seed and distributed among their neighbors, thus inducing them to try its cultivation as a new economic possibility. At this time, rice which was grown in the low swampy land, was approaching its maximum production in the colony, but the planters desired some crop that could be profitably grown on the higher lands. Indigo seemed to fulfill these qualifications and its cultivation spread so rapidly that, during the year

*Presented at Saturday afternoon session, Annual Meeting, Dec. 3, 1932.

1747-48, it was being exported to England to the amount of 134,118 pounds weight valued at about 17,000 pounds sterling. During the same year, there were exported 55,000 barrels of rice, valued at about 88,393 pounds sterling.

As stated above, indigo was grown in the colony before the experiments of Miss Lucas, for, as early as 1723, the Colonial Legislature granted a bounty on each pound exported. After so extensive cultivation of the plant, this bounty was removed in 1746 as it placed a much too heavy burden on the other colonists. The indigo from the American colonies attracted considerable attention in England. At that time, England was importing 600,000 pounds annually from France, her commercial rival, at a cost of 150,000 pounds sterling. At the request of the colonists and England wishing to encourage the growth of indigo in her provinces, Parliament in 1848 passed an act allowing a bounty of six pence (about 12 cents) per pound on all indigo imported from British colonies. This was reduced to four pence in 1764. The growth of indigo had already become a profitable commodity and with this added incentive the exportation from South Carolina and Georgia rapidly increased. By 1754, the export from Charleston amounted to 216,924 pounds. An evidence of the change from the cultivation of rice to indigo is indicated in the exports of these two products during the following years; in 1760-61, 100,024 barrels of rice were exported, and in 1761-62 only 36,272 barrels, while indigo had increased to 239,629 pounds. The decline in rice was partly due to overproduction and low price. Just before the Revolution, 1775, the exportation of indigo amounted to 1,150,662 pounds, valued at $1.10 to $1.20 per pound of our present currency. From 1749-1773, the British Government paid 145,022 pounds sterling, or about $725,000, in bounties on American indigo, practically the whole of which came from Charlestown. Other ports in the South Carolina province, Georgetown and Beaufort, exported indigo but records of these ports were destroyed during the Civil War. The English Colonies not only ran the French provincial indigo out of England, but undersold them in the general European markets.

Culture in Georgia

As stated above, indigo was introduced into Georgia from South Carolina. Records concerning its culture are not as complete as those in South Carolina, but it is certain that it was not as extensively grown. In 1743, we find the statement[5] that "indigo flourished in Georgia," and in 1850 that "many farmers were engaged in the cultivation of indigo."[6]

By 1756, there were exported 9,395 pounds and in 1763, 9,633 pounds.[7]

Another writer states that in 1758 there were 25,000 pounds weights exported.[8]

Many references in the colonial records can be found concerning its intermittent cultivation, but there are no available records showing the amount exported from this colony. It was grown for home consumption even up to and during the Civil War.

Culture in Louisiana

There are records in the annals of Louisiana to show that as early as 1720, indigo seeds were supplied to the colonists by the Louisiana Company, but its cultivation was not so extensive as in the above mentioned colonies. Here, too, the records are incomplete, but we find that in 1769 indigo shipments were valued at approximately $100,000 and in 1775 a single settlement in the colony shipped 50,000 pounds weight.

We cannot find records for all the colonies for the same year, but if we assume an average yield from each colony, based on the years given, it would be safe to estimate the total amount shipped from the American colonies, during the years just prior to the Revolution, to be from one to one and a quarter million pounds per year.

The Indigo Plant and Extraction of the Dye

There were two varieties of indigo cultivated in these colonies; first, that imported from the West Indies (I. anil and I. tinctoria), which was an annual plant; and second, the native wild or indigenous variety (I. Carolinia and I. leptosepala). Although the imported types had to be planted yearly, it was preferred, because of its greater yield of dye, to the native plant, which was septennial and more hearty. The plants grew well in dry loose soil and were cultivated much like cotton but did not demand so careful attention as the latter. In outline, it resembles cotton to some extent except that is branches were more smooth, straight and slender. The dye occurred principally in the pinnate leaves, which were bluish-green in color. The flower was purplish-yellow and bell shaped, giving upon maturity a bean shaped pod.

It took from two to three months after seeding for the plant to mature. The seeds were planted about the middle of April and harvesting began the latter part of June or first of July. It was usually cut when the plant was in full bloom at which time the leaves became thicker, juicy and would break when doubled together. Harvesting was done, if possible, during the early morning or late afternoon, to prevent undue withering. The plant was cut close to the ground and the roots were disturbed as little as possible so that the second, and sometimes third, crop might develop. It was bound into bundles and hauled to the "indigo vats" where it was subjected to a simple process for extracting the dye.

The "weed" was placed in the "steeper," which consisted of a cypress or pine tank about sixteen feet square and from three and a half to five feet deep, weighted down and covered with water. The dye occurs in the plant in the form of a soluble glucoside indican. In the

steeper this is broken down by fermentation into glucose and the soluble indoxyl, the enzyme or ferment being present in the plant. The fermentation process usually required from 10-14 hours, depending upon the temperature. To determine the point at which the aqueous solution should be drawn from the extracted plant, was the purpose of the "indigo maker," who proved his skill by determining the exact time of withdrawal to give a high quality dyestuff. Many tests were given to indicate this end-point and when reached the liquor was drawn into the "beater." The beating vat was about fifteen feet long, eight feet wide and five feet deep, and made of the same material as the steeper. In this vat the dark-green, blue tinged solution of indoxyl was oxidized by atmospheric oxygen, precipitating the dye as a fine blue silt, which settles to the bottom of the tank. The beater derived its name from the fact that in the early days negroes were employed to whip the solution with bushes, or paddles, but this process was later accomplished by securing paddles or perforated wooden buckets on an axle shaft, placed lengthwise of the vat, and turned by negroes. After precipitation had begun, lime water was added from the "lime vat." Here, again, there was considerable disagreement as to the necessary quantity and some claimed that lime ruined the dye. Agitation could not be continued too long after precipitation as fermentation set in again and formed what was known as "burnt dye." Precipitation was complete after about an hour of agitation and the blue precipitate was allowed to settle. The supernatant liquid was drawn off by a series of holes in the side of the beater and the dye was strained through a woolen cloth. This gave about a five per cent paste, which was carried to the "indigo shed." Here it was pressed to remove as much water as possible, cut into cubes about two inches square and dried on trays, each batch being carefully segregated as it might have a different shade. The drying had to be done in the shade as the sun injured the wet dye and during this process the cubes were turned periodically. After drying it was placed in an open-headed barrel, covered with damp moss and allowed to mold, which required several days. The mold was brushed from the cakes, dusted with some dry indigo and then graded. The best grade was termed "fine blue," the next "ordinary blue,"[9] then "fine purple," and the most inferior, "ordinary copper." It was then packed[10] in barrels for shipment to the seaport where it was graded by the "Indigo Inspector," a representative of the government, who decided upon the quality or grade of the dye.

During the process of fermentation there arose disagreeable odors from the vats and the extracted plant attracted flies, the latter probably being due to the sugars present from the decomposition of the indigo glucoside. It was said that these odors were very unhealthy and on early statutes of Georgia, the following law was passed:[11] "An act to oblige the planters of indigo after steeping the weed to bury or destroy it within a limited time." It stated further that the extracted weed was to be buried "at least two inches under the surface of the earth or otherwise effectually destroyed within forty-eight hours after such weed shall be taken out of any vat or vats . . ."

The estimated average yield was from 30-40 pounds per acre, although some state that good land would produce as high as 80 pounds. The usual calculation was that eight good slaves could cultivate, harvest, extract and prepare for the market the dye from forty acres, "raise provisions besides and have the winter months to saw lumber."[12] The return for the crop depended upon the quality of the dye and the price varied from 30 cents to $2.25 per pound. It was said that a planter could double his capital in three to four years. One Georgia writer,[13] in 1751, stated that the planters had brought the commodity somewhat into disrepute by attempting to produce quantity instead of quality.

The Decline of Indigo Culture

The cultivation of indigo grew rapidly once the planters realized the profits that it yielded. There was a gradual increase in the production from the time of Miss Lucas' experiments until just prior to the American Revolution, when the exportation reached the maximum. During the Revolutionary war it could not be classed as a "necessity" and its culture was overshadowed by that of rice, and England, which consumed practically all of the American indigo, was lost as a market. After the war, with their market shattered and many of their plantations destroyed by the British, its cultivation was limited. One historian states that, "in 1793 indigo began to be cultivated again and 2051 casks were exported, and continued to be a valuable export for several years."[14] In 1828-1829, planters were encouraged to diversify their farming and plant indigo instead of cotton.[15] It was cultivated to a comparatively small extent up to and during the Civil War, but most of it was consumed locally or "vended in the neighboring states." In 1848, there is published an account of the amount grown in one of the central districts (Orangeburg) of South Carolina.[16]

Year	Acres Planted	Pounds Made
1831	953	27,700
1841	1,091	34,150
1842	1,337	35,935

The price ranged from 40 to 80 cents per pound.

The principal causes for its decline are as follows:

(1) England, upon the loss of the colonies, naturally discontinued paying the bounty on American indigo.

(2) Soon after the Revolution, Sea Island cotton was introduced, 1786 in Georgia, and the planters turned their attention to its cultivation. Also, about this time, (1792) the cotton gin was invented, which stimulated

the culture of that commodity. The preparation of cotton for the market did not demand any technical or skilled labor, and the plantations were free from the offensive odors associated with the indigo vats. In Louisiana, its culture was replaced more by the cultivation of sugar cane than by cotton.

(3) During the Revolution, indigo was imported into Europe from the West Indies, as well as other countries, until it was no longer profitable to cultivate the plant.

Thus we have the "swan song" of indigo cultivation in this country. It is difficult to estimate its ultimate beneficial effect upon the development of those colonies which used it as an early export. This is especially true for South Carolina as many of the large plantations near the coast owe their origin, their wealth, and their cultural effect on the colony to the cultivation of rice and indigo. It has been said that "indigo was more profitable to South Carolina than the mines of Mexico and Peru were to Spain." The loss of this source of income was a severe shock to the planters of that day, but it does not compare with that loss felt about one hundred years later by another of England's colonies, India, by that epochal piece of research of von Baeyer and Knop, the production of synthetic indigo.

[1]Ross, B. B., Ind. and Eng. Chem., *14*, 1153 (1922).
[2]Copenhaver, J. E., Ind. and Eng. Chem., *22*, 894 (1930).
[3]A. S. Salley, Jr., the Introduction of Rice into South Carolina. Bulletin of Historical Commission No. 6, (1919) Columbia, South Carolina.
[4]Ravenel, Eliza Lucas Pinckney, (Charles Scribners and Sons, N. Y. 1896); Southern Agriculturist, VII, 514, 1834 (Charleston). Here is found a letter to her grandson, giving an account of her first attempts to grow the plant and the immediate expansion of its cultivation.
[5](Colonial Records of Georgia, 5, 696).
[6](Evans, L. P., History of Georgia, p. 44) (1900).
[7](McCall, Hugh, History of Georgia, p. 174; 209) (1811).
[8](Stevens, W. B., History of Georgia, 1, 457).
[9]Southern Agriculturist, *2*, 154-164,, 1829 (Charlestown), for description of extraction.
[10]Wallace in The South in the Building of the Nation, *5*, 178-183. The Southern Historical Publication Society, Richmond, Va.
[11]Colonial Records of Georgia, Statutes, Colonial and Revolutionary 1774-1805, *19*, part II, 33-35.
[12]"A Description of South Carolina" by order of Governor Glenn in 1761. (Charlestown, South Carolina.)
[13]Colonial Records of Georgia, *26*, 235.
[14]McCrady, History of South Carolina Under the Proprietary Government, 187.
[15]Southern Agriculturist, *I*, 484, (1828) Charleston, South Carolina.
[16]Tuomey, Geology of South Carolina, Appendix, 23 (Columbia, South Carolina), 1848.

Discussion

Prof. Copenhaver: I have here a print which was published two years ago by the "Charleston News and Courier of an old indigo plant. I will pass it around, if anyone wants to look at it. I also have here some indigo plants, if anyone would care to look at them. They are very fragile.

President Rose: Is there anyone who would like to ask any questions about this historical paper on the position occupied by indigo culture?

I should like to ask whether in the literature there is a good picture of the indigo plant. I was asked that the other day and was unable to present one.

Prof. Copenhaver: That is the only one that I know of in the literature and that was published by the "News od Courier" in 1930 at the celebration of the 20th anniversary—

President Rose: What I had in mind was the actual plant itself on a scale big enough so that it could be used in an educational primer of some kind or other.

Prof. Copenhaver: You can get the pictures of the indigo plants but none of the old plants in South Carolina.

Question: Is there any of that indigo growing wild now?

Prof. Copenhaver: Yes, the indigo plant grows wild in this country. I don't know the plant when I see it in the woods, but it grows wild in this state and in South Carolina, and I think generally over the East.

President Rose: The next paper on our program is one which bears the title, "Textile Reminiscences," and will be presented by Mr. J. E. Hardin, of the Proximity Manufacturing Co. Mr. Hardin! (Applause.)

. . . Mr. Hardin presented his prepared paper. . . . (Applause)

(See next page)

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(Continued on page (47) 63)

Proceedings of the American Association of Textile Chemists and Colorists

Some Reminiscences on the Textile Industry*

By **JOHN E. HARDIN**

Secretary and General Manager, Proximity Manufacturing Company, Greensboro, North Carolina

I DESIRE, first of all, to express to you, the members of this Organization, the very great pleasure of those of us who live in Greensboro and this immediate vicinity, that you have chosen this place in which to hold your meeting. We most sincerely welcome you and hope we may not fail in our attempts to make you glad that you came to Greensboro. We feel singularly honored that you are here. Only healthy and substantial progress in the advancement of your science can result from meetings of this kind, to which large numbers of highly trained men and men of broad experience from all parts of the country, come together and exchange ideas pertaining to the varied problems which so sorely vex us in these trying days.

We are living in an age of great advancement and enlightenment in all lines of human endeavor, and we are charged with extraordinary cares and responsibilities, if all the things expected of us are to be successfully accomplished. Many of these cares and responsibilities have caused what little hair some of us have left, to become not only very thin, but to be tinted with a delicate shade of gray, which cannot be produced by any other dye yet compounded.

The textile industry probably reflects in its history more thrilling events and more constructive accomplishments than any other of the fundamental industries. That is a broad statement, but the history of our industry in all of its different branches blazes across the horizon of many centuries, back as far as human records reveal.

The first inhabitants of this earth decorated their naked bodies with colors as varied as the proverbial Joseph's coat and wore skins of animals for clothes. Madam Eve, with her fig leaves, was no trifling modiste. She at least utilized color and had originality in her designs.

The craftsmanship of color has done its full measure in recording and transmitting to us much of the doings, inspirations and ideals of the ancients. Color and textiles combined have wrought mightily in developing and hastening progress, broadening the vision, intensifying the ambitions, solidifying the character, and keeping the lights of the human intellect trimmed and burning.

The mere making of fabrics and colors to beautify them, while fundamental and vitally necessary for human comfort and happiness, does not represent the major achievement in our important industry. But the intense interest in these processes, the failures, the successes, and inspirations, the visions resulting therefrom, and the lofty motive of their most successful exponents, have done more than that: They have improved human character and broadened our spiritual horizon.

The pleasures and advantages to be derived from reminiscing are incalculable. If we pause occasionally and realize where we have come from in this industry; where we are now; and whither we are probably headed, we will no doubt have more interest in, and zeal for the work in which we are engaged, and the goal toward which we are lavishing our life's best efforts.

Color

"WHERE HAVE WE COME FROM" in this textile industry and science of color? Color started with the beginning of earthly things. As soon as there was light there was color and instantaneously mortals were endowed with the faculty of discriminating between beauty and ugliness. Colors are much older than the knowledge of how to produce them, or to imitate the original God-given standards. You dyers and colorists work to standards. The Great Jehovah set a few standards in his Firmament during the first week of His earthly creations and bedecked the earth everywhere with hues and tints which will keep the most skilled of your craft busy trying to reproduce for many generations yet unborn. And then, Almighty God, who sits on His great White Throne will still hold in His mighty hand those immortal standards, still unsuccessfully matched.

Clothes and colors have played a most important part in human desires and human necessities through all the

*Presented at Saturday afternoon session, Annual Meeting, Dec. 3, 1932.

ages of the world's history. The first interesting romance we seem to have relating to the production of color on cloth leads back in the form of a Legend to the early days of that comely nymph, "Tyros," as she leisurely strolled with her lover on the glistening sands of the shores of the Mediterranean. When she saw her poodle dog bit into a strange fish she noticed a fascinating purple stain which remained on the puppy's mouth. Then and there she inspired her hot-hearted, eager-to-please, boss-dyer-lover to catch some more of those strange fish and extract that marvelous coloring material from them. With this he dyed a frock for her and thereby originated the famous Tyrian Blue, used for many centuries to color the royal robes of kings, princes and priests.

After that daring young Prince, Alexander the Great, had led his conquering armies to India, Persia, Arabia and Egypt, plundering and appropriating to himself whatever was of interest and profit; he returned to his cultured Greek admirers with a strange substance which he named "vegetable wool," which in reality was some original variety of cotton, and with it also brought a marvelous process for producing gorgeous black, green and yellow colors. That blazed the trail and opened up and exploited great channels of trade and commerce, the chief articles of which were textiles and coloring materials. He then founded his namesake city—Alexandria, in Egypt, which became for thousands of years and still is, the center of the world's finest and most silk-like cotton. Centuries ago there were heralded to the then known world the glories of that historic metropolis on the Nile, which produced marvelous fabrics with rich and wonderful colorings which are still in existence to baffle and awe textile designers and colorists of today.

Centuries ago the Persians developed a secret method for making rugs, by the manipulation of a few crude sticks and strings, and driven by that great dynamic force of human ambition to excel. They colored these rugs with mineral and vegetable dyes, the secret of the application of which no scientist knows. They represent an art, ambition and tradition, and a life's work which are admired and sought after in the world's most cultured centers.

Block Printing

On the other hand, block printing was brought by the Arabs into Spain when they conquered that country in the eighth century. This was a great improvement over hand painting on cloth as practiced by the Hindoos and was used exclusively for over a thousand years for producing figured textiles. But that process pales and flops into insignificance when compared with the modern sixteen-color intaglio monster textile printing machine, with delicately engraved copper rolls and using your vat and fast colors and driven by variable speed electric motors at terrific rates of perfect production.

When that daring Navigator, Christopher Columbus, first came to American shores in 1492, he found the natives gently snoozing out their daily siestas in *hammocks*. Had he explored into Mexico and Peru, he would have found the Aztecs practicing the art of making cloth and dyeing cochineal red and other beautiful colors.

The Germans, Dutch, French and English improved and refined the vegetable, animal and mineral dyes and afterwards they originated the aniline and coal tar colors, and next the synthetic colors and vat dyes.

American Dyes

Up to the outbreak of the World War, Germany had a world monopoly on the color industry. That crisis found America with its mammoth and highly developed textile industry apparently hopelessly enthralled in the very embarrassing predicament of having no dyestuffs. It was this crisis which gave birth to the spectacular development in our own country of a dye and chemical industry, which astounded the world,—all of which is just another tribute to American ability, ingenuity and resourcefulness.

Up to November 1st, 1915 we had produced few dyestuffs in this country of any consequence except small quantities of sulphur colors and it was about that time that research work really began in earnest and the American people were brought to the serious realization that something would have to be done immediately to develop a color industry in this country if the manufacturers of articles requiring color were to carry on.

I have in my possession a small bottle containing about two ounces of what is supposed to be the first synthetic indigo produced on the American continent. This was brought to Mr. Ceasar Cone by the late Dr. Dow, early in the year 1917. Up to the outbreak of the World War the mills with which I am associated consumed about one-third of all of the indigo imported into the United States. You can imagine the embarrassing position in which we found ourselves, when the supply of German indigo was so suddenly cut off. The only substitute left available and procurable in quantity for producing dark shades of blue, was logwood extract. The difficulties we experienced in producing a shifting and uncertain blue from a dyestuff naturally black, will remain as a nightmare to haunt the ambitious of those who propose any substitute for that old reliable blue dyestuff known as indigo and its synthesis. Today American dye manufacturers are able to furnish us with all classes of colors of excellent quality and in successful competition with foreign manufacturers.

If you will pardon a political reference, I desire to state that I am one of those optimistic Southern Democrats, who does not believe in the creation of an unreasonably high tariff wall to protect to the point of unsound economics, our American Industries against for-

eign competition, but only insofar as is necessary to equalize the cost of efficient production, and to give the American workman a just and fair wage compensation commensurate with this skill, intelligence and high standards of living. An unreasonable tariff places our American export goods in very distasteful favor with our foreign would-be-customers, and inclines them to exercise a full measure of retaliation against our goods.

English Inventors

It would be amiss in these reminiscences on textile to omit a reference to the tremendous importance of the basic processes relating to the making of fabrics invented by those early Englishmen, Messrs. John Kay, James Hargraves, Richard Arkwright and Samuel Crompton. Their contributions to our industry can never cease to merit our sincere appreciation and admiration for their marvelous ingenuity. Their inventions opened the door to a new day for the production of fabrics of all kinds, and a new era for administration to human needs and pleasures. The discouraging days in which they wrought out their marvelous achievements and the trying conditions under which their inventions were exploited, and unappreciated by their contemporaries, are probably not fully enough realized by those of us who at best have contributed little except refinements to their great original basic ideas. We have accomplished far less in the way of valuable initiative and ingenuity, but we have entered into their labors and are reaping the benefits of their marvelous vision.

Samuel Slater

When Samuel Slater organized and built the first mechanical cotton factory on the North American continent at Pawtucket, R. I., in 1790, and brought the inventions of those world famous Englishmen, to this country and built them with his own hands into practical working machines, and put his mill into successful operation—he blazed the way for the start of the textile industry in this country. He did more than that. He was the original outstanding captain of our industry. He set a standard for this nation for improving the conditions of working people to a far greater extent than any of his predecessors or contemporaries. He was not only a pioneer in cotton manufacturing, but he organized and conducted in his own house the first Sunday School ever organized in America and taught his employees and their children to read and write and to revere and love the Holy Scriptures. Mr. Slater was therefore, the original American cotton manufacturer, master builder, teacher and outstanding citizen and was responsible for successfully planting on this continent an industry which has contributed so lavishly to creating wealth, initiative and administering to human needs.

Henry Humphreys

In 1828 Henry Humphreys founded the Mount Hecla Steam Cotton Mills in Greensboro, N. C., on almost the exact spot where we are now assembled. It consisted of less than 3,000 spindles and 75 looms, and made plain white sheeting, shirting and osnaburg, and also cotton warp yarn. His customers came from far and near in wagons and camped around his factory, waiting and begging to buy the products of his wonderful ingenuity. He sent agents with part of his products in large four-horse wagons to other communities and sold them direct to the individual families, taking in return cotton, wool, provisions, and articles of trade of the times for the use of his employees and to sell to others. He also devised and secured authority from the State to issue a system of local currency or money which was the popular and reliable medium of exchange in this community at that time. He established in this community a new means of livelihood and inspired new ambitions in the lives of the citizens of Carolina. He was another captain of the hosts of early industrialists and a merchant prince and financier, who established here a sound system of economics, which I doubt if to this day has been improved on for fundamental soundness, even by the modern textile merchants, jobbers, chain stores and bankers.

Mr. Humphrey's face was turned toward the rising sun and he lighted the way for those of us who thought less worthy in initiative and accomplishment, but have tried to enter into his labors and are travelling in comfort, safety and prosperity the trail which he so courageously blazed.

Edwin Holt

One of Mr. Humphrey's young apprentices, was the ambitious Edwin Holt of Alamance County, who a short time afterwards bought a few crude spindles, wrought by hand in a blacksmith shop in Philadelphia and hauled that machinery in slow ox and horse drawn wagons over long and rough muddy roads all the way from Philadelphia to a point near Burlington in Alamance County, North Carolina. He built a few crude power looms and developed a small water power, and started up the original cotton mill, known as the Alamance Factory. From the Mount Hecla Steam Cotton Mills and the Alamance Factory sprang the present textile industry of the Piedmont section of the Carolinas, which now boasts more than ten million spindles and is probably the highest developed and in normal times, the most successful textile area which has ever existed throughout the history of the world.

Tradition relates that Mr. Holt hired a French tramp to teach him how to produce colors on cotton yarn. He made his first dyeings in a cast iron wash pot, which is still in existence and treasured by his successors as a loving relic of those courageous times. He rinsed and

developed the stock in wash tubs and hung it out on the fence to dry and warped and prepared by hand his yarns for weaving, and thereby established the first colored goods mill in this section.

These early pioneers laid a sub-foundation deep down on a solid rock for the textile industry which has meant more for the Genuine development of the South in all of its rich fulness than any of their military or political contemporaries.

Old Time Dyeing Fomulae

It will interest you to hear some of the formulae for dyeing in use about that time.

TO DYE GREEN:

"Take red oak and hickory bark, equal parts, boil them together very strongly, then take out the bark and pour in the vitriol and indigo very slowly, make the dye boil, then put in the banks of yarn and keep stirring, then boil 15 minutes, then remove the stock and give it the air; then put the stock back into the liquor and boil 5 minutes longer, take the stock out, hang it in the shade and give it some more air. One-half pound vitriol, one ounce indigo, two pounds alum to dye twelve lbs. of wool. The dyeing to be made in a copper vessel. The indigo and vitriol to be mixed overnight."

TO DYE RED:

"Two lbs. of Brazil wood will dye two lbs. of yarn. Boil it in a copper kettle until the color has been extracted out of it, during which time the yarn will be washed clean and let it lay in strong alum water, then strain the dye and rub the stock and dye and alum water together; put all in a kettle and simmer them slowly. Be sure to give the stock the air frequently. This quantity will dye a beautiful crimson, and by using half that quantity a paler shade of crimson will be dyed."

TO DYE YELLOW:

"Make a strong soap suds with warm water, put the Arinetto into a thin bag and rub it out in the suds, then put in the hanks of yarn and let them soak an hour or more, then put them with the suds into a pot and boil 15 minutes, take them out, dry and then wash them in cold water."

Present Conditions

These methods of dyeing and producing colors on textiles may seem crude to you doctors of chemistry and highly specialized modern dyers and colorists, but please remember that these were the best methods that they had at their command. The fastness, permanence and beauty of some of those colors were really remarkable.

As to the present position of the textile and color industry, I need not elaborate on that, because we are all familiar with it. One of the most tragic situations in it has developed within the last few years. When we realize the condition which now exists in some of our sister states in the East and view the great textile plants which have flourished in some of these states for generations, but which are now still and cold in the process of liquidation, we are saddened to realize the underlying cause of this catastrophe. I am persuaded by some of my friends connected with those plants, in whose opinions I have confidence, that these unfortunate conditions are largely the result of the lack of cooperation between owners and employees and State governments. These three fundamental elements have not worked together and the lack of harmony has all but ruined a great industry.

The rapid growth and phenomenal success of cotton manufacturing in our own Piedmont Section must not be taken by us too much as a matter of course, nor that it will continue simply because we are so singularly blessed with so many natural advantages. We who live in this section and are engaged in this industry must recognize the tremendous responsibilities that devolve upon those of us connected with and responsible for its management. We must bear in mind that we are obligated to those who have invested capital in this industry and are in like manner responsible to those who are working with us to the end that hearty cooperation for the common good of all must be the chief incentive for the full development and carrying on of an industry which has created a new day and has caused the Sun of hope to shine again on a section which was so tragically blighted only a few decades ago.

In the early stages of the development of the cotton manufacturing industry in the South, only plain and staple goods were made, but in recent years we have expanded into the manufacture of finer classes of fabrics. The dyeing and finishing end of the business has also been developed hand in hand with the making of finer goods, until today we have in this section of the South a high development of the bleaching, dyeing, printing and finishing branches of the textile industry. In the early history of colored goods here in the South, none of the mills pretended to do even the simplest processes of finishing. Cheap plaids, ginghams and cheviots were shipped all the way to the North to be calendered, napped, tentered and finished.

As recently as in the early nineties, there was established here in Greensboro probably the first plant, South of the Mason and Dixon line for finishing colored cotton goods and this probably was the most practical means of demonstrating to Southern manufacturers of colored fabrics the necessity of doing their own finishing. Since then the finishing of the better grades of fabrics has received great impetus and has resulted in the establishment of a number of modern and successful bleaching, dyeing, printing and finishing establishments.

Many of our Northern friends have moved down here and have cast their fortunes and careers with us and they

and the textile schools and native talent have aided greatly in the development of this important branch of the textile industry. We have room for them all here.

We also need to become more painstaking, more scientific and to apply more serious efforts to research work to the end that our industry may be more thoroughly and successfully carried on.

It is a long call between the hand painting of the Hindoos and block printing methods of producing colored figures on textiles as practiced by the early Europeans. It is an even longer stride between crude block printing and the modern 10-color Duplex printing machines, using fast, bright vat colors and running at 50 to 100 yards per minute, producing fabrics of the highest quality and embodying the most beautiful reproductions of art. It is machines of this character which have made it possible to manufacture fabrics that can be sold at only a few cents per yard, so that enough can be bought by the American girl for less than a dollar to make a dress, which would put to shame the robes and gowns of queens of the royal blood produced centuries ago, under conditions of serfdom and servitude, which stifled human ambition and vision.

The next serious problem which those coming after us will have to face is: *Whither are we headed? What Does The Future Hold In Store for Our Industry?*

That future is vaguely concealed from our view by a thin curtain, woven from the silken threads of applied science in that golden loom of unsatisfied research, and with that undaunted shuttle of human preseverance, bleached in the blazing sun of intelligence, skill and honesty, and colored with that amazing and delicate hue of an unbounded ambition.

APPLICANTS FOR MEMBERSHIP

(Continued from page (42) 58)

Gustave Hug—Chemist, Hydro, Inc., 100 East 5th St., Paterson, N. J. Sponsors: Edward H. Staab and A. Newton Graves.

Frank A. Stubbings—Dyer, Pilgrim Piece Dye Works, 1 Nassau Ave., Brooklyn, N. Y. Sponsors: Carl Toepler and Wm. H. Cady.

Junior

C. V. Clapp—Textile Chemist, Wilkes Hosiery Mills, North Wilkesboro, N. C. Sponsors: Albert H. Grimshaw and Hugh Puckett.

James J. Fanale—Textile Chemist, Research Laboratory, United Piece Dye Works, Lodi, N. J. Sponsors: R. Boehringer and Andre Schoen.

Student

D. H. Kennemur, Jr.—Student, Clemson College, S. C. Sponsor: Alfred R. Macormac.

G. B. Dorn—Student, Clemson College, S. C. Sponsor: Alfred R. Macormac.

Corporate

Evanston & Levering Co.—Third and Jackson Sts., Camden, N. J. Scouring, Carbonizing and Depainting of Wool and Noils.

Analytical Methods for a Textile Laboratory

The Council of the A.A.T.C.C. believing that Dr. Scott's series of articles entitled "Analytical Methods for a Textile Laboratory" might well be brought together in book form, have proceeded with its publication. The book contains 80 pages, and is of handy size for use in the laboratory. They may be obtained from the Secretary of the Association for 75 cents.

STANDARD SILK SAMPLES

There have been prepared, under the direction of the Sub-Committee on Fastness of Dyed Silk, standard dyed silk fabrics to represent four classes of fastness to washing—namely, Class I, Class II, Class III and Class IV. These standards have been carefully dyed with the dyestuffs and according to the dyeing methods recommended in the 1931 Year Book.

The A. A. T. C. C. is prepared to furnish sets of these washing standards for a nominal charge which will cover the cost of preparation. It will be possible to accurately grade the fastness by comparing it with the standards after subjection to the standard washing tests approved by this Association. All inquiries concerning these Silk Washing Standards may be addressed to the Chairman of the Research Committee.

Louis A. Olney,
Lowell Textile Institute,
Lowell, Massachusetts.

AMERICAN
DYESTUFF
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Published biweekly by
HOWES PUBLISHING CO., INC.
440 Fourth Avenue, New York City

A. P. HOWES
President

M. D. REESER
Secretary

H. F. CRAWFORD
Treasurer

Subscription price: $5.00 per year; Canadian $6.80; foreign $6.00

Vol. XXII January 16, 1933 No. 2

MOVEMENT FOR QUALITY CONTINUES

THE National Quality Movement, as sponsored by the National Retail Dry Goods Association, is continually gathering strength and its effects are becoming more and more apparent and widespread. All during the depression there has been a steady and consistent attempt to undermine the standards of quality and substitute in their place a price standard resulting in a cheapening of products and a dissatisfaction among consumers. This quality movement on the other hand has been continually at work during recent months trying to place quality, as a basis for selling goods, in its rightful place. The price appeal which has been so apparent is one of the most regrettable results of the depression. Prices have dropped entirely out of proportion to any sound reasoning and have been a contributing factor in prolonging the depression. Price competition has resulted in the production of goods that have been entirely unsuited for the purposes for which they were intended. The distressing point about this whole system is that instead of being cheaper, such products are, in the long run, much more expensive, due to their poor quality. Prices are lower now than they have been for some time. Quality goods can be purchased at very little higher cost than cheap products. This offers an opportunity for manufacturers of quality goods to drive inferior products from the market. People must be educated to buy on a quality basis and that is what this National Quality Movement is striving to do.

"Q"
STANDS FOR QUALITY
This is the mark of the National Quality Movement sponsored by the National Retail Dry Goods Association to keep America on the quality standard. As believers in quality merchandise we urge support of this movement. BUY Quality.

Buying on a price basis has gained such a firm hold on the minds of the consuming public that it will not be a matter of changing their opinions overnight. In a special bulletin of the National Retail Dry Goods Association, the statement of P. A. O'Connell, president, has particular significance in this regard. It is as follows:

"It took three years of violent price appeal to make people forget quality. It may take equally as long, with sound advertising and promotion, to bring quality back to its rightful place of supremacy. But it is being done.

"By experience the consumer knows that quality merchandise is the most economical and the most beneficial. Merchants and manufacturers know it is the most direct route to business recovery, because quality restores confidence, both in the minds of business men and of the consuming public.

"All signs are most encouraging. Throughout the country the National Quality Movement has met with amazing enthusiasm—a reception far exceeding the most hopeful expectations. Support of the movement is pouring in from all sides. Most encouraging of all, merchants and manufacturers are putting into practice the quality they are preaching, and are increasing their business by doing so.

"The National Quality Movement will take time in fulfilling its purpose, but with the forces at work it is bound to be successful. Already its benefits are giving new life to business, and each forward step brings immediate results in the form of restored confidence and a more profitable basis for retail merchandising."

This movement is an appeal to the common sense of the American workingman and consumer. If we have faith in this common sense, and we do have, there is no reason to believe but what we will again be manufacturing and selling on a quality basis. This movement is for the benefit of the consuming public, directly and indirectly. Directly in that it gives a person his money's worth and indirectly in that it is helping to bring better business conditions and more employment.

Style appeal must be satisfactorily combined with quality appeal. An article must not only look good but it must have serviceability. Many inferior products have been sold on a style appeal, with the necessary low-price attraction. But they did not have serviceability. Take for example a colored shirting not dyed with a fast color and selling for fifty cents. It has style appeal but no serviceability. The same style shirt but dyed with a fast color might cost a dollar and a half, but it has the added quality of *serviceability*.

We are glad to see this movement gaining strength and we believe that we all should adopt the slogan advanced by this association "'Q' Stands For Quality."

INEXPERIENCED WORKERS

OCCASIONALLY we have calls for men experienced in various phases of the textile wet processing industry and, of course, we get a great deal of satisfaction in finding the right men to fill these positions. However, in the last two or three years, we have noticed a decided lack of calls for men who do not have experience in some particular branch. The reason for this is, undoubtedly, that business firms find it too expensive to break in men at this particular time. When laboratories and mills are looking for men they want those who can become immediately productive, and the person who cannot boast of some specialized experience is generally unconsidered.

By an unexperienced worker we do not mean one who is uneducated or without training in laboratory or mill practices. There are many recent graduates of the various textile schools, who, with a few years of actual work in a laboratory or mill would become invaluable men later on. If these men are not given an opportunity to work now, how will they obtain that experience upon which basis they can be hired?

We must hire men with an eye toward the future. Men of experience can, at the present time be hired, in many cases at a very small salary. When times improve these same men can command much higher salaries with some other firm and they will leave. However if a trained man, but one without experience, is hired now and becomes experienced through his work he will be much more apt to stay with the firm when conditions improve. He will moreover be an important asset to his firm.

It will be a good investment for firms to hire these inexperienced men now and be prepared with a group of skilled workers when that time comes when there will be dearth of experienced men.

COMMUNICATION

THE CHEMICAL FOUNDATION, INCORPORATED
New York City

January 5, 1933

Editor,
AMERICAN DYESTUFF REPORTER,
440 Fourth Ave.,
New York, N. Y.
Dear Sir:

I am sending you by hand with this note, an advance copy of a book just being published by The Chemical Foundation, written by Professor Zanetti of Columbia University, entitled "The Significance of Nitrogen."

I ask for its review by your paper, and its consideration as news in view of the cables from Chile in reference to the Cosach.

In the spirit of fair play, I ask you also to publish a letter I am sending with a copy of this book to each member of the Congress, congratulating that body upon its cooperation in building the independence of America. Our Congress is submitted to so much abuse that certainly we ought to be willing to give them a hand when they have legislated patriotically and successfully.

Very truly yours,

(Signed) FRANCIS P. GARVAN,
President

[EDITOR'S NOTE: *A review of the book in question will be found on page 68 of this issue of the* REPORTER. *Mr. Garvan's letter to members of Congress follows*:]

THE CHEMICAL FOUNDATION, INCORPORATED
New York City

(To All Members of Congress)
Dear Sir:

The American chemist is delighted today to be able to assure the Congress of the United States that they may decide the foreign debt question, or any other foreign question, absolutely free of any dependence on the outside world for any necessity of national life—national health, agriculture or defense. In these days of criticism, it is a pleasure to assure you that this independence is due to the united efforts of the Congress of the United States, our educational forces and the support of all the people, with the exception of our international bankers who have been at all times the enemies of American chemistry and have loaned over Two Hundred Million Dollars of the savings of the American people to foreign competitors in their effort to destroy our progress.

Let us look for a moment at the record:

"New York, March 6, 1915.

"Hon. William J. Bryan,
Secretary of State,
Washington, D. C.

"My dear Mr. Bryan:

"Referring to my letter of yesterday regarding the dyestuff situation, I beg to say that I received the following cable this morning from Germany via Milan: 'Latest developments make further shipments dyestuffs impossible.' The cable was sent to me by Dr. Adolph Haeuser.

"The same man that, as I have shown before, wrote the letters directing what Germany wanted in a tariff policy. He has now been made the head of them all—'the president of the Verein zur Wahrung der Interressen der Chemischen Industrie, Deutschlands'; which is composed of the various chemical and dyestuff manufacturers of Germany, with headquarters in Berlin, and shows the attitude of German manufacturers of dyestuffs in the present crisis.

"It is safe to assume that they will take every precaution and go to any length to prevent their products reaching consumers of enemy countries, and unless some agreement can be reached to have the present condition modified, the manufacturers of this country will suffer as much as those of belligerent countries.

"Yours very truly,

"H. A. METZ."

(Continued on Page 69)

Textile Shrinkage Control

What Can Be Done About It?*

By **GEORGE H. JOHNSON**
Dept. of Research, Laundryowners National Ass'n.

A CAREFUL review of the many observations and viewpoints published in the "Control of Shrinkage" Section of the *Daily News Record* issue of October 17 establishes beyond a question of doubt that the subject of pre-shrinking is being carefully studied by many individuals in the converting, finishing and manufacturing fields. Already there are many, who have become convinced that consumer-satisfactory fabrics are essential to the well-being of their business. Noting some of the weaknesses that exist under present conditions, they are desirous of correcting existing faults, where they occur, with an idea of building to the future.

The following, in my opinion, are among the highlights established by the Control of Shrinkage Section:

Demand for Pre-Shrinkage

"Control of shrinkage is not the product of the inventive mind of the textile industry, it has been born of necessity—an insistent demand from the consuming public—and those who contend the public will not pay for serviceable qualities in washable textiles are applying the traditional thinking of their grandfathers in the industry. * * * * The idea of the consumer accepting an explanation that some agency or restorative method outside the control of the textile industry is responsible for lack of control of shrinkage qualities in textiles is gone forever," J. C. Turrell.

Variations in Shrinkage Methods

Several observers, including C. Goldsmith, agree that there are a number of entirely satisfactory shrinking methods on the market that cause no consumer complaint. On the other hand there are other pre-shrinking methods, such as some of the older water-shrinking processes, that do not show the same efficiency in pre-shrinking. Unfortunately, there appear to be some converters who are perfectly satisfied with these more or less unsatisfactory methods of shrinking. When, as reported, the same number of yards are demanded of the finisher as that sent to him, goods so treated may hardly be properly pre-shrunk under such conditions.

One hardly needs to be a prophet to predict that when improperly pre-shrunk garments are sold to the consumer, her reaction to the retailer selling such merchandise as pre-shrunk is not going to be a pleasant one.

The Effect of Low-Price Demands Upon Pre-Shrinking

Several were of the opinion that the present low-price era in textiles has somewhat hindered the adoption of satisfactory pre-shrinking methods on a wider scale. Admitting, for the sake of argument, that such might be the case, it would seem that the adoption of pre-shrinking methods satisfactory to the consumer would be a means towards bettering quality and at the same time raising prices to a point where a profit is obtainable. There is strong possibility that new profitable business can be created in view of present consumer demands. In this connection one manufacturer has stated very definitely that his sales of pre-shrunk garments are ahead of what they were a year ago, in spite of the fact that price has been maintained and not lowered.

Shirting Situation

It is perfectly obvious that considerable headway is being made at present in the shirting field, where the subject of shrinkage has gained widespread attention. Reputable shirt manufacturers everywhere appear to be capitalizing upon consumer demand for properly pre-shrunk materials. The shirt industry, furthermore, is a pioneer in establishing specifications as to what is meant by a "pre-shrunk" shirt or a "pre-shrunk collar or neckband" shirt. Such a policy is bound to eliminate consumer confusion and thereby protect the shirt manufacturing industry.

Washsuit Situation

Greater consumer interest than ever was established during the summer of 1932 in washsuits. A questionnaire just received from nearly 200 laundryowners has established the fact that fewer shrinkage complaints were encountered during the past season than had ever before been the case. Almost without exception shrinkage complaints were limited to the cheaper lines of wash suitings and to such numbers as had been sold with the admonition, "Dry Clean Only." In the latter case it was apparent that a few manufacturers were attempting to "get by" without pre-shrinking their lines—a make-shift to say the least. The feeling of many washsuit manufacturers is that the pre-shrinking of washsuit materials is a

(Continued on Page 71)

*Laundryowners' National Association *Bulletin.*

Washington News Letter

(Continued from Page 36)

obtained hold when yarn twist, thread count and other details of fabric construction differ.

Sheets for test have been used and laundered as high as two hundred and forty times. New sheetings of known grades of cotton have been used for studies of the effect of different ironing temperatures on cotton fabrics. The temperature and the moisture content of the fabric were controlled and even pressure maintained. Deterioration is determined by color tests and changes in tensile strength and chemical composition. The modified-spectrophotometric method used for the color tests involved determinations of the amount of light reflected from the cloth in the red, yellow, green, blue and violet portions of the spectrum. By means of the blue-violet light emitted from a mercury arc lamp it was possible to detect changes in the fabric samples for ironing temperatures at least 65° C. lower than those required to change the tensile strength of the cloth. It has been demonstrated that if several thicknesses of fabric ironed at the higher temperature ranges are superimposed, their changed color is readily apparent in ordinary daylight. A comparison of the effect of high ironing temperature upon sheets in actual use has been made for one group of sheeting materials by means of the changed reflection for the blue-violet light.

The current program of wool investigations includes a study of the durability of different kinds of wool when used in blankets. Both wear and laundering tests are included and an abrasion apparatus has been provided to obtain a laboratory index of wear. A study of chemical methods of evaluating wearing qualities of woolen materials is in progress, incident to the laundering studies. The conclusion is that washable woolens, such as blankets and flannels, are made from such lightly twisted yarns that their initial tensile strength is low and the usual mechanical tests can not be made a sensitive index of deterioration. Latent damage due to faults in methods of wet processing in manufacture or laundering can be measured only by chemical means. The methods being investigated include colorimetric tests of scale damage, change in sulphur content, and change in nitrogen content.

Proceeding on the theory that the finishing of cotton fabrics at the mill as well as in laundering has an important bearing upon the satisfactory use of the fiber, the Bureau is making studies of the relative value of starches and sizing ingredients. Especial attention has been given to the needs of fabrics requiring a penetrating size and a soft fine finish. Following announcement of the effect of the addition to sizing mixture of various fats and other ingredients, appraisal is being made of the value of rice, dasheen, taro, and other plant resources that are in domestic supply in quantities ample to render American industry independent of all foreign sources.

[Watch future issues for more of these interesting communications]

BOOK REVIEW

The Significance of Nitrogen, by J. Enrique Zanetti, with an introduction by Francis P. Garvan. Published by the Chemical Foundation, Incorporated, 654 Madison Avenue, New York City.

According to the author in his preface the object of this book is to acquaint the non-technical reader with the problems that are now arising out of the struggle being waged in the field of nitrogen. Technical terms have been avoided. He also states that most every one knows more or less about the significance of nitrogen in connection with fertilizers, but the equally important bearing that it has on national defense and the chemical industry is not as widely recognized. It is with these thoughts in mind that the book has been written. There are many illustrations.

The chapter headings, which give an idea of the contents of the book are as follows:

I. Nitrogen in General.
II. The Chilean Nitrate Industry.
III. The Atmospheric Nitrogen Industry.
IV. The United States and the Nitrogen Problem.
V. Conclusions.

In the appendix are included the following:

I. Short Bibliography of Works on Nitrogen.
II. World Production and Consumption of Fixed Nitrogen.
III. The U. S. Dept. of Agriculture speaks regarding Natural and Synthetic Nitrate of Soda.
IV. The Cosach Indebtedness—Proposed Reorganization of the Cosach.
V. Extract from the Annual Report of "Imperial Chemical Industries, Ltd."
VI. Tariff Rates, Licenses and other restrictions on the Importation of Nitrogen Products into Germany, France, Italy, Poland, Czechoslovakia, Japan, Belgium, United Kingdom and Canada.
VII. The Effect of the Synthetic Nitrogen Industry on Prices of Nitrogen in the United States.
VIII. The Japanese Press and the Nitrogen Situation.

"Camacyl"

On and after January 15th, 1933, the name of the John Campbell & Co. colors for Acetate Silks, now known as "Celacyl" will be changed to "Camacyl."

This change will only affect the name, and not the colors themselves, which will continue to feature the same strength, brightness and fastness as heretofore.

Communication

(Continued from page 66)

"Serial No. 432 of March 13, 1915. It is reported to me by Hossenfelder" (German Consul General in New York) "telegram No. 4, that the stock of dyes in this country is so small that by a German embargo about 4,000,000 American workmen might be thrown out of employment. Bernstorff."

* * *

This was our condition of servitude in 1915. Today, under the fostering of Congress, we are able to supply ninety per cent of our consumption of dyes on which, in 1929, sixteen billions of American production was dependent, and in case our imports were ended, our production of dyes would be ample to supply all our needs.

From report of Consul General Hossenfelder to the German Government, to His Excellency, the Imperial Chancellor, Doctor von Bethmann-Hollweg, dated New York, March 3, 1916:

"Neither through money nor the granting of credit, nor by any other means, can that critical situation be relieved which has been called forth by the removal of certain articles which are obtainable only in Germany. These articles are chiefly potash, chemicals, and dyestuffs. Potash is desired by agriculture, inclusive of the cotton planters, all the more urgently since even last year sufficient fertilizer could not be brought to the soil. To enumerate the industries which are suffering from the scarcity of German chemicals would lead too far. I may, however, mention that the cry for help which comes from the world of physicians is becoming louder and louder and more and more insistent."

At that time we were dependent upon Europe for many drugs, including Salvarsan, the sole remedy for our ten million syphilitics, Luminal, the sole alleviate for epilepsy, and so forth. Today we make all our drugs, of better quality than are known in the world, and at infinitely cheaper prices than we paid the foreigner. For instance, Salvarsan before the war sold for about $3.50 an ampule. Today the highest quality sells for 60 cents an ampule. The importation of drugs is negligible.

March 13, 1926, the Committee on Interstate and Foreign Commerce of the House of Representatives submitted a report on the control by foreign governments of production and exportation of certain raw materials essential to our progress.

"1. That controls of either production or exportation which materially affect prices have been instituted by direct or indirect foreign governmental action as follows: The Government of Great Britain, through direction of its colonial office to its East Indian possessions, over rubber; the Government of the State of Sao Paulo, Brazil, over coffee; the Government of Chile over nitrates and iodine; the Governments of Germany and France over potash; the Government of Egypt over long-staple cotton; the Government of Japan over camphor and at times over silk; and the Government of Yucatan, Mexico, over sisal."

Today the chemist has sprung us loose from all these controls, with the exception of coffee, tea, tin and sisal:

(1) Potash has been discovered in the south-western states in ample quantity to supply the United States. Its ability to compete with the potash from the cartels of Germany and France is only a question of freight rates. The ownership of these beds of potash, however, should be watched by the Government.

(2) Manganese. Mr. Charles H. Herty, Jr., son of Dr. Charles H. Herty, has worked out a process whereby our own ores can be used, and thus we become independent of Russia.

(3) Camphor. The du Pont Company has just finished their plant, sufficient to supply the needs of the country with synthetic camphor.

(4) Rubber. Synthetic rubber has been perfected by the du Pont Company and is being produced in a semi-works plant. Of course, we cannot produce rubber to compete at the present price of 4 cents, but a possible recurrence of the Stevenson Act monopoly is at an end. The above Committee found that 36 cents was a fair and proper price for the foreign monopoly to exact from our people. They found that under the Stevenson Act the price reached $1.21 in 1925, and that in 1926 over Six Hundred Million Dollars above the fair and proper price was extorted from our people by the government control monopoly. By the discovery of our chemists, we are assured that the price will never again go above 20 cents without meeting the competition of American synthetic rubber, and this limit may well be lowered by the usual progress in lessening chemical costs.

(5) Rayon can readily take the place of silk.

(6) Iodine is now being produced by the Dow Chemical Co. from bromine and oil wells. This production can easily, in the case of necessity, be expanded to cover our needs.

(7) The possibility of growing an ample supply of long-staple cotton has been developed under the guidance of our Department of Agriculture.

(8) And now come Nitrates from the air. Ten American plants are producing and stand ready to produce the entire necessities of this country in peace and war, for agriculture and for munitions, at a price to equal the costs of the world. The farmer today is getting his nitrates for $22.00 a ton, against $36.00 a ton today paid by the German farmer, and against the former price of $90.00 during the war and $48.00 in 1926.

This whole story is set forth in the book I am sending you by Professor Zanetti, which is an unbiased and careful examination of the importance of nitrates in our national life.

It might be added that we have the phosphate rock and the potash and the nitrogen, and we are the only country of the world which has all the necessary ingredients for fertilizers for its soil.

There remain only coffee, tea and tin. Coffee and tea are not necessities and their synthesis is being worked on by our chemists. For tin there are many substitutes in alloys and other products.

This is an independence possessed by no other country in the world, and it is the object of destruction by world cartels, assisted by our so-called American international bankers.

In addition to the creation of this new independence, chemical education in high school, in college, in graduate school and research institutions, is offering 100% service to our medical profession, to all our industries and to our national defense.

Two Hundred and Fifty Million Dollars have been expended in chemical laboratories in our educational institutions alone.

Our developed chemistry is also able to service the allied sciences of physics, electricity, medicine, etc., as nowhere else in the world. Arithmetic alone of our sciences has been neglected. "Remember, O Stranger, Arithmetic is the first of the sciences and the mother of safety."

Our schools stop the teaching of arithmetic at the age of twelve, and as a nation our people are trying to fight the great battle of life with a child's knowledge of its basic science. Let us develop the teaching of arithmetic through high school and college.

After all, we constitute a great village, and peace, contentment and prosperity wait upon our patriotism, our home contentment and the ability to mind our own business.

Remember the concluding lines of Oliver Goldsmith's great poem, "The Deserted Village":

"Aid slighted truth, with thy persuasive strain
Teach erring man to spurn the rage of gain;
Teach him that states of native strength possest,
Tho' very poor, may still be very blest;
That trade's proud empire hastes to swift decay,
As ocean sweeps the labour'd mole away;
While self dependent power can time defy,
As rocks resist the billows and the sky."

May we not add reproach of the "Deserted Village" to that of the Forgotten Man.

Wishing you a Happy New Year,

Yours very truly,

(Signed) FRANCIS P. GARVAN,
President

Frank Lees Convalescing

Friends of Mr. Frank Lees, Chemist with Bosson & Lane, Inc., will be interested to learn that he is convalescing from an operation, and expects to be out among his customers within a few weeks.

Textile Foundation News

"Every Monday morning, millions of housewives throughout the United States are busily engaged in removing dirt and oil from clothing in the weekly wash. To these women, cloth seems to pick up oil all too readily, and they would think it very strange indeed if one were to tell them that manufacturers go to great pains to put oil into cloth. Yet this is exactly the case," says A. N. Rogers, a Foundation Research Fellow at Lehigh University, Bethlehem, Penna., who is working under Drs. E. R. Theis and H. M. Ullman.

"It is very difficult, if not impossible, to spin threads from dry fibers. Cotton, silk, wool and many other natural fibers are harsh and brittle. Silk thread, for example, consists of individual fibers cemented together by sericin, a glue secreted by the silkworm during the spinning of the cocoon. This glue is extremely dry and brittle, and presents edges so sharp that the thread will cut grooves in the porcelain guides over which the thread passes during the processes of manufacture. In addition, any fabrics made from such thread would be seriously lacking in strength and pliability.

"In order to overcome this difficulty, manufacturers 'lubricate' the silk fibers before spinning. The silk is soaked for several hours in emulsions of oil contained in metal-lined wooden tubs. In order to cause the oil to mix with water and penetrate the silk, an emulsifying agent, such as soap, must be employed. Lately, experiments have been made with other emulsifiers such as sulphonated oils. These treatments render the silk soft and pliable; and the finished product, after the oils have been removed, has a very high tensils strength.

"Much of the texture and strength of the finished product depends on the type of oil used and its manner of application. Each manufacturer uses a process which he considers superior to all others. This process he guards jealously. As a result, silks produced by different concerns from the same raw fiber may be entirely different; and even separate lots from the same mill may show wide variation.

"In order to eliminate guess-work and rule-of-thumb methods in silk soaking, this research was undertaken. What are the characteristics of a good soaking oil? What type of emulsifying agent is best? Why do two seemingly identical soaking baths give different products? Does the acidity of the bath have any effect? In addition, soaking oil contains bacteria which attack the protein of which the silk is composed. What is the action of these bacteria and how may it be controlled? To these and similar questions we hope to find an answer. Uncertain methods must be replaced by carefully controlled processes."

Work on the "Effect of Bacteria and Vegetable Oils on Silk" is progressing satisfactorily, according to Rogers' report received by Henry B. Thompson, a director of the Foundation, and released recently from Washington. Mr. Thompson stated that from time to time similar re-

ports will be released, written in layman's language, so that the general public will have an appreciation of what is being done for their benefit through scientific research in textiles.

Knitted Outerwear Week

The number of exhibitors who will display their wares to hundreds of knitted outerwear men at the Grand Central Palace during "Knitted Outerwear Week," February 13th to 17th, is continually increasing. Moreover, many exhibits of an interesting and instructive nature are being arranged in elaborate fashion.

One knitting machine manufacturer will display no less than four of his machines in operation, knitting novelty fabrics in a variety of intricate patterns and combinations of color such as the prevailing modes dictate. As the attention of the sportswear manufacturer is being turned greatly toward producing new fancy fabrics this display is expected to provoke widespread comment. Other manufacturers will operate machines demonstrating their particular point of interest in knitting. Needle manufacturers, yarn spinners, dyers and jobbers, as well as button makers, button hole machine companies, and numerous others will feature their articles and services in such a manner, that even the visiting layman will find the story of knitted outerwear and its production an absorbing one.

Another feature turning knitted outerwear interest to New York during "Knitted Outerwear Week" is the fact that the annual convention of the Knitted Outerwear Association is being held simultaneously. The business sessions will take the form of a series of luncheon meetings.

Among those who have reserved space are the following:

Jules Desurmont Worsted Co.; Jacquard Knitting Machine Co., Inc.; Davison Publishing Co.; Yarn Dept. American Woolen Co.; Rose Mills, Inc.; E. W. S. Jasper; Thos. Wolstenholme Sons & Co.; Masurel Worsted Mills, Inc.; H. Brinton Co.; Clifton Yarn Co.; Howes Publishing Co.; Melliand Textile Monthly; Harry Schwartz; Reece Button Hole Machine Co.; Knitted Outerwear Age; T. J. Porter & Sons; Crawford Mfg. Co.; Singer Sewing Machine Co.; Queens Machine Corp.; Mayfair Yarncraft; Schumer & Friedman; Robaczynski Machine Corp.; Textile World; Morrow Sales Corp.; N. Lands; Waterman Currier Co.; Thomas B. Bradley, representing Statesville Cotton Mills; New Brunswick Needle Co. and Grisman Company.

Mr. A. B. Coffman is Exposition Manager, and Mr. M. E. Thayer is assisting him. The Exposition office is room No. 1126, Grand Central Palace, and space reservations may be made there.

Massachusetts Textile Schools

Continuance of the Lowell Textile Institute, New Bedford Textile School and the Bradford Durfee Textile School, Fall River, is advocated by the joint special committee on public expenditures in its report to the Legislature in Massachusetts. In this connection the committee recommended that fees of $75 for students who reside in the state and $150 for those who are not residents be charged at New Bedford and Fall River, where at the present time no charge is made.

"Although the prosperity of the textile industry in Massachusetts has rapidly declined, the committee does not feel that the time has been reached when our three textile schools should be closed, particularly in view of the fact that more than 85 per cent of the enrollment is composed of evening students," states one section of the report.

"We feel very strongly that everything possible should be done to assist evening students in all schools. American boys and girls who work by day and who are willing to give their evenings to study in an effort to improve their condition in life, rather than spend their spare time in pleasure, should be encouraged to the utmost.

"Students at the Lowell Textile Institute who live in Massachusetts are now charged an annual fee of $150 for attending day classes. Students from outside the Commonwealth pay fees of from $200 to $300. We feel that these fees are sufficient in proportion to fees charged at other state educational institutions.

"No fees are charged under the present arrangement at the textile schools in Fall River and New Bedford. We recommend that day students at these institutions be required to pay an annual fee of $75, if they reside within the Commonwealth, and a fee of $150 if they are non-residents. Such an increase in fees will provide additional revenue estimated at $15,000 per annum."

Silk Association Dinner

The sixty-first annual dinner of the Silk Association of America, Inc. will take place January 19 at the Waldorf Astoria, New York City. Paolino Gerli, Silk Association president, will preside. More than eight hundred of the silk industry, government officials, and officials of silk producing countries, are expected to attend.

Textile Shrinkage Control

(Continued from Page 67)

necessity and that the adoption of suitable methods of pre-shrinking is essential for the future increase in wash-suit volume.

Conclusion

In conclusion, the commercial laundry industry has watched the slow but steady increase in the use of pre-shrinking processes during recent years. A few years ago everybody said "it couldn't be done." Time, however, has shown that "it can be done." Progress is being made.

Supramine Red 6BL

Supramine Red 6BL is a new acid dyeing red offered by the General Dyestuff Corporation.

Dyed from a Glauber's salt-sulphuric acid bath, it produces a bright bluish red which is said to be of very good fastness to light. This, it is claimed, makes the new brand especially adapted for the producing of mode shades on ladies' dress goods, in combination with Alizarine Direct Blue A2G and Fast Light Yellow 2GX Conc. The fastness to hot pressing, carbonizing, stoving, rubbing, and alkali, is also said to be very good, according to the distributors. In fastness to water, washing, and perspiration, it meets the general demand required for ladies' goods.

New Vat Color

The line of vat colors and naphthols produced by American Aniline Products, Inc., is constantly increasing.

The recently added Amanthrene Blue RCL Paste is said to meet with great favor throughout the trade.

Silk Properties

Neither ice nor water nor cold is able to destroy the strength or lustre of pure silk, as is strikingly illustrated in two interesting cases in which silk has recently been recovered after long exposure to the elements, the Silk Association relates.

In reclaiming the cargo of the sunken British steamer "Egypt" a piece of dyed silk was discovered. This silk fabric had been submerged 420 feet under the ocean for ten years, and yet showed no injuries as to resistance, feel or lustre, and only a slight loss of color in some places.

Row silk which fell into a river in Canada when a transcontinental train was wrecked about two years ago, was recently recovered. Upon being tested this silk was found to have lost little of its normal tenacity and winding qualities. The river in which it had been submerged for two years had frozen over, while the silk lay on the river bed.

Hercules Elects New Board Members

Two new directors were elected to the board of directors of Hercules Powder Company recently. The new members are: A. B. Nixon, general manager of the company's cellulose products department; and P. B. Stull, general manager ot the Virginia cellulose department.

A. B. Nixon has been general manager of the cellulose products department since 1928 and was formerly in charge of the company's nitrocellulose plant at Gillespie, N. J. Mr. Stull has been general manager of the Virginia cellulose department since 1928 and was formerly president of the Virginia Cellulose Company of Hopewell, Virginia, which was acquired by Hercules in 1926.

Associates with Beach Soap Co.

Mr. James L. Drury of Cranston, R. I., formerly of Lever Bros. Co. Industrial Sales Dept., has become associated with the Beach Soap Co. of Lawrence, Mass. as their Southern New England representative. He will carry a complete line of textile soaps and glycerine.

American Aniline Branch

American Aniline Products, Inc., will open a larger branch at 1000 West Morehead Street, Charlotte, North Carolina.

This branch will include office, laboratory, storage, and mixing rooms. The laboratory and mixing rooms will be in charge of personnel that have been closely in touch with the Southern branch of this business.

Mr. F. Young, who will be in charge of the laboratory, has been making demonstrations throughout the South, on the American Aniline Products, Inc., new vat colors and Naphthols.

Mr. A. S. Cooley has been appointed Charlotte branch manager.

Print Card

The General Dyestuff Corporation releases the sample card "Prints with Rapidogen Dyestuffs" illustrating the new group of Naphthol print colors which are fixed by an acid ageing. All the existing brands are shown in pleasing designs, printed on cotton, and on mixtures of rayon and cotton.

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

CLASSIFIED

POSITION WANTED—Experienced salesman, demonstrator or dyer. Has thorough knowledge of domestic and imported dyestuffs and their application. Desires location in Southern or New England territory as salesman-demonstrator or dyer. Knows both Southern and New England trade. Can dye piece goods, raw stock, yarn and hosiery. Address Box No. 759, American Dyestuff Reporter, 440 Fourth Avenue, New York.

CHEMIST—Assistant dyer, 28 years of age, married; graduate Lowell Textile Institute, 2½ years' experience in laboratory of leading dyestuff concern. Familiar with uses and application of all classes of textile dyestuffs. Desires position in laboratory of dyestuff concern, mill or sales. Can go anywhere. Address: Box No. 747, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

MAN